The PHOTOFACT® Servicer

SET 472 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ JAN., 1960

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This Servicer provides you with essential data on other models or special equipment not covered in standard PHOTOFACT folders. The schematics and supplementary data included here will be of valuable help to you in servicing this equipment.

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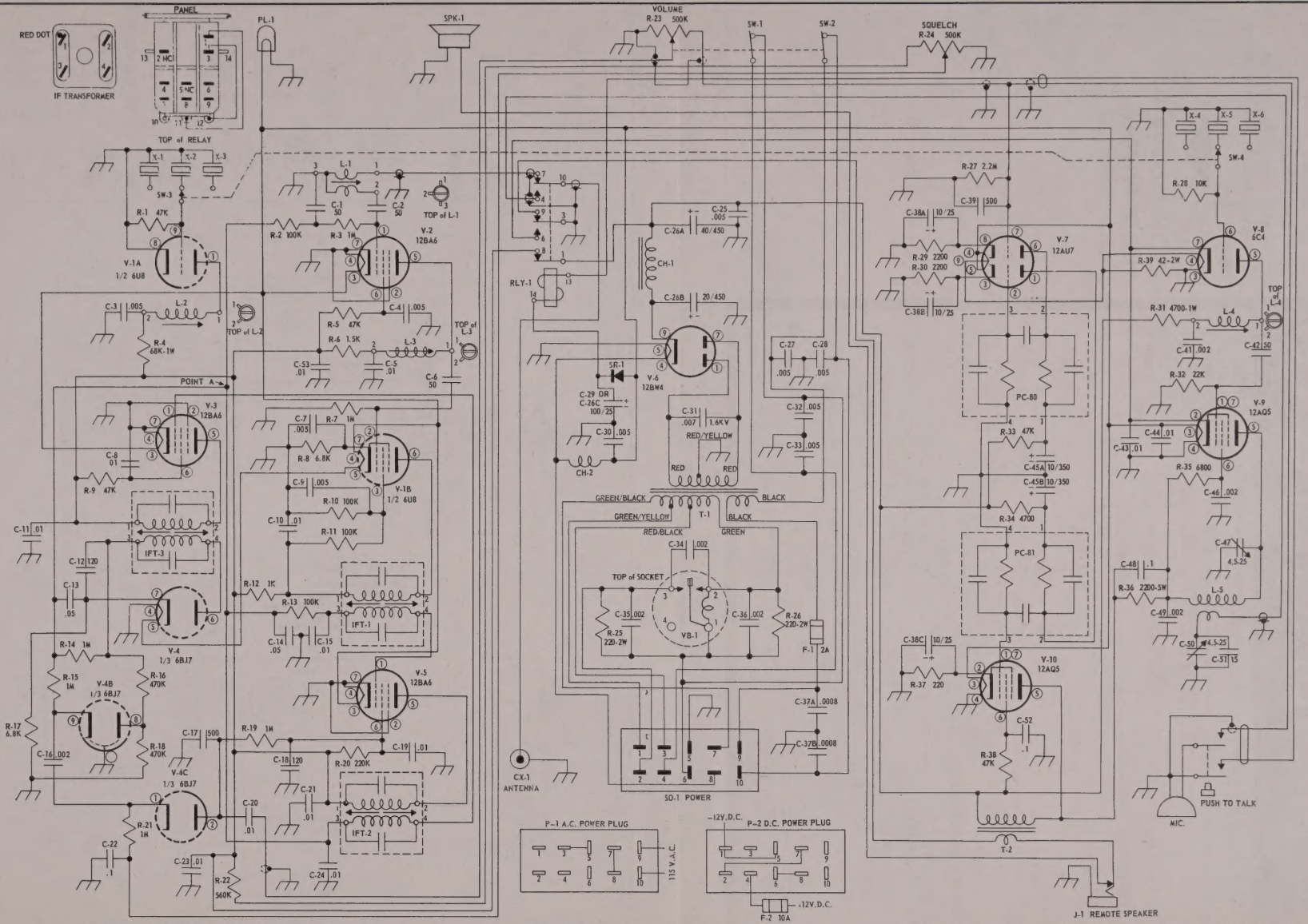
Globe Electronics

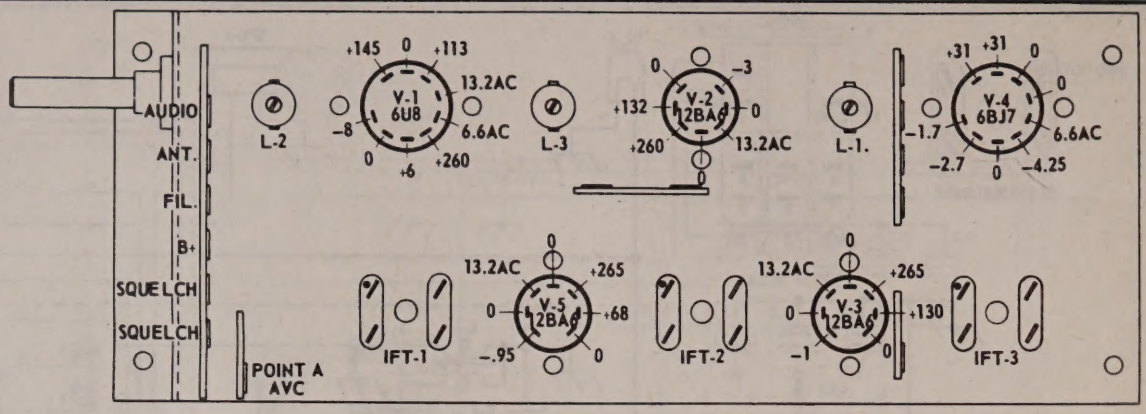
Model CB-100



GLOBE ELECTRONICS MODEL CB-100

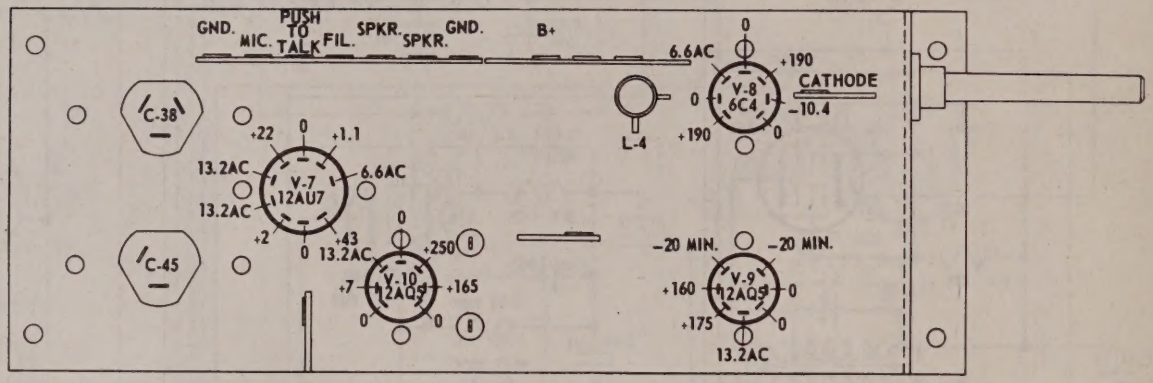
(For Voltages See Reverse Side)

Schematic Diagram Courtesy of Globe Electronics



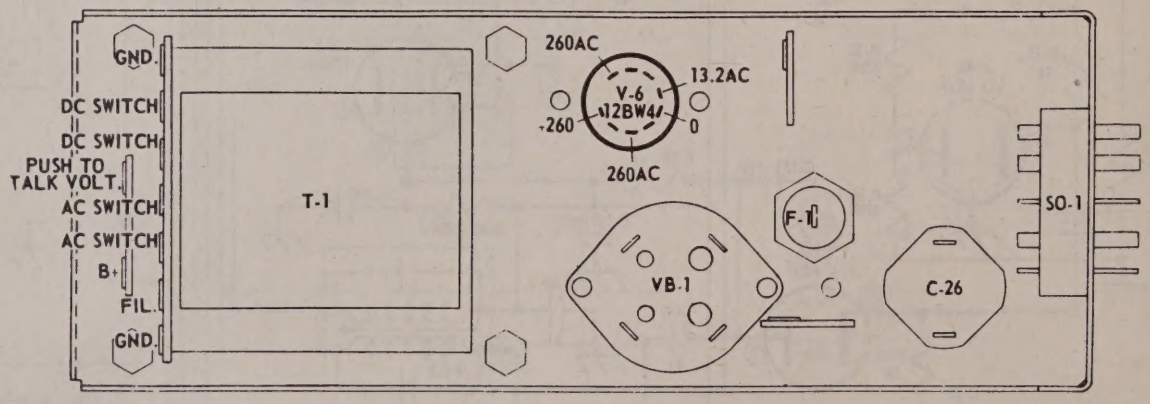
VOLTAGES – RECEIVER SECTION

LINE VOLTAGE – 117V
SQUELCH -- OPEN
VOLUME – MID RANGE
RECEIVE POSITION
MEASURED WITH RCA VOLTOHMIST V.T.V.M.
NO SIGNAL BEING RECEIVED
ANTENNA DISCONNECTED



VOLTAGES – TRANSMITTER SECTION

LINE VOLTAGE 117 V.A.C.
MIKE SWITCH DEPRESSED
MEASURED WITH R.C.A. VOLTOHMIST
LOADED TO ANTENNA
NO SIGNAL APPLIED TO AUDIO INPUT



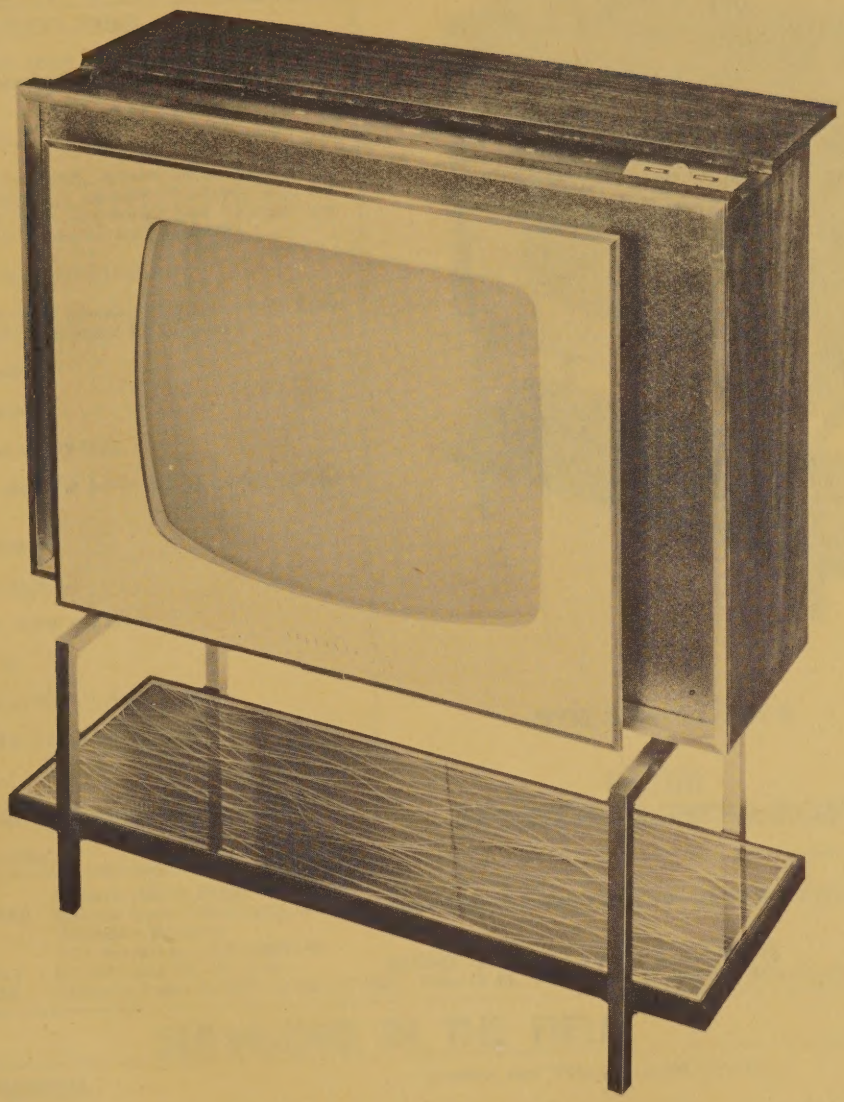
VOLTAGES – POWER SUPPLY SECTION

LINE VOLTAGE 117V
B+ LOAD – 85MA

PHOTOFACT® Folder with CIRCUITRACE*

SYLVANIA MODELS
23S23, 23S24M (Ch. 1-541-7, -8, -9, -0)

SYLVANIA MODELS
23S23, 23S24M (Ch. 1-541-7, -8, -9, -0)



MODEL 23S24M (Ch. 1-547-9)

SYLVANIA MODELS
23S23, 23S24M (Ch. 1-541-7, -8, -9, -0)

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PHOTOFACT® Folder with CIRCUITRACE*

SYLVANIA MODELS
23S23, 23S24M (Ch. 1-541-7, -8, -9, -0)

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL MODEL 23S24M

Remove 8 push-on type knobs from top of cabinet. Remove 10 wood and 1 metal screw holding rear cover. Remove the rear cover.

Upper Chassis Removal

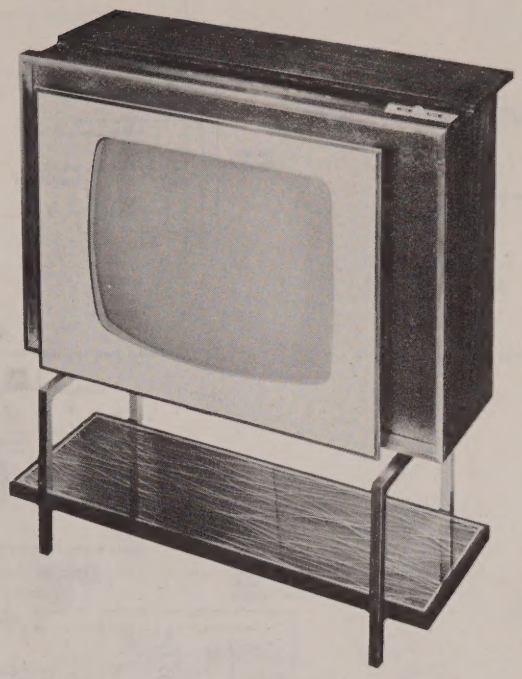
1. Remove picture tube socket, speaker leads, ground wire between upper and lower chassis, HaloLight plug, and interchassis lead plug. NOTE: DO NOT operate set without ground wire connected to both chassis.
2. Remove vertical hold knob extension.
3. While supporting upper chassis remove 2 chassis bolts at upper right and one at upper left of cabinet.
4. Remove upper chassis.

Lower Chassis Removal

1. Remove yoke plug and HV lead.
2. Remove 1 wood screw at lower left of cabinet holding lower chassis.
3. Remove lower chassis.

PICTURE TUBE REMOVAL

1. Remove chassis, upper and lower.
2. Remove speakers.
3. Lay cabinet face down on a soft material.
4. Remove 4 picture tube mounting bolts.
5. Remove cabinet.
6. Remove 8 screws holding 4 picture tube brackets.
7. Remove picture tube.



MODEL 23S24M (Ch. 1-547-9)

CAUTION

ONE SIDE OF AC LINE CONNECTED TO CHASSIS.

TRADE NAME	Sylvania Models 23S23, 23S24M (Ch. 1-541-7, -8, -9, -0)
MANUFACTURER	Sylvania Home Electronics, Div. of Sylvania Electric Products Inc., 700 Ellicott St., Batavia, N.Y.
TYPE SET	Television Receiver
TUBES	VHF-Seventeen, UHF-Eighteen
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING 165 Watts, 1.6 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

The safety glass is an integral part of picture tube and cannot be removed for cleaning.

FUSE DEVICE

A Circuit Breaker is used for low voltage power supply protection, and may be reset by depressing the reset button. (For location, see "Tube Placement Chart".)

TUNER OSCILLATOR ADJUSTMENTS

To touch-up the VHF Oscillator, it is necessary to remove the chassis. (See Disassembly Instructions".)

AGC

The AGC may be varied by means of an AGC control. (For location, see "Tube Placement Chart".)

FOCUS

The focus may be varied by means of a Focus control. (For location, see "Tube Placement Chart".)

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

The Horizontal Frequency slug is used for the Horizontal Hold. (For location, see " Tube Placement Chart".)

WIDTH

The width may be varied by a Width coil. (For location, see "Tube Placement Chart".)

BUZZ ADJUSTMENT

To eliminate intercarrier buzz, adjust the Ratio Detector secondary (A11) located on top of chassis.

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

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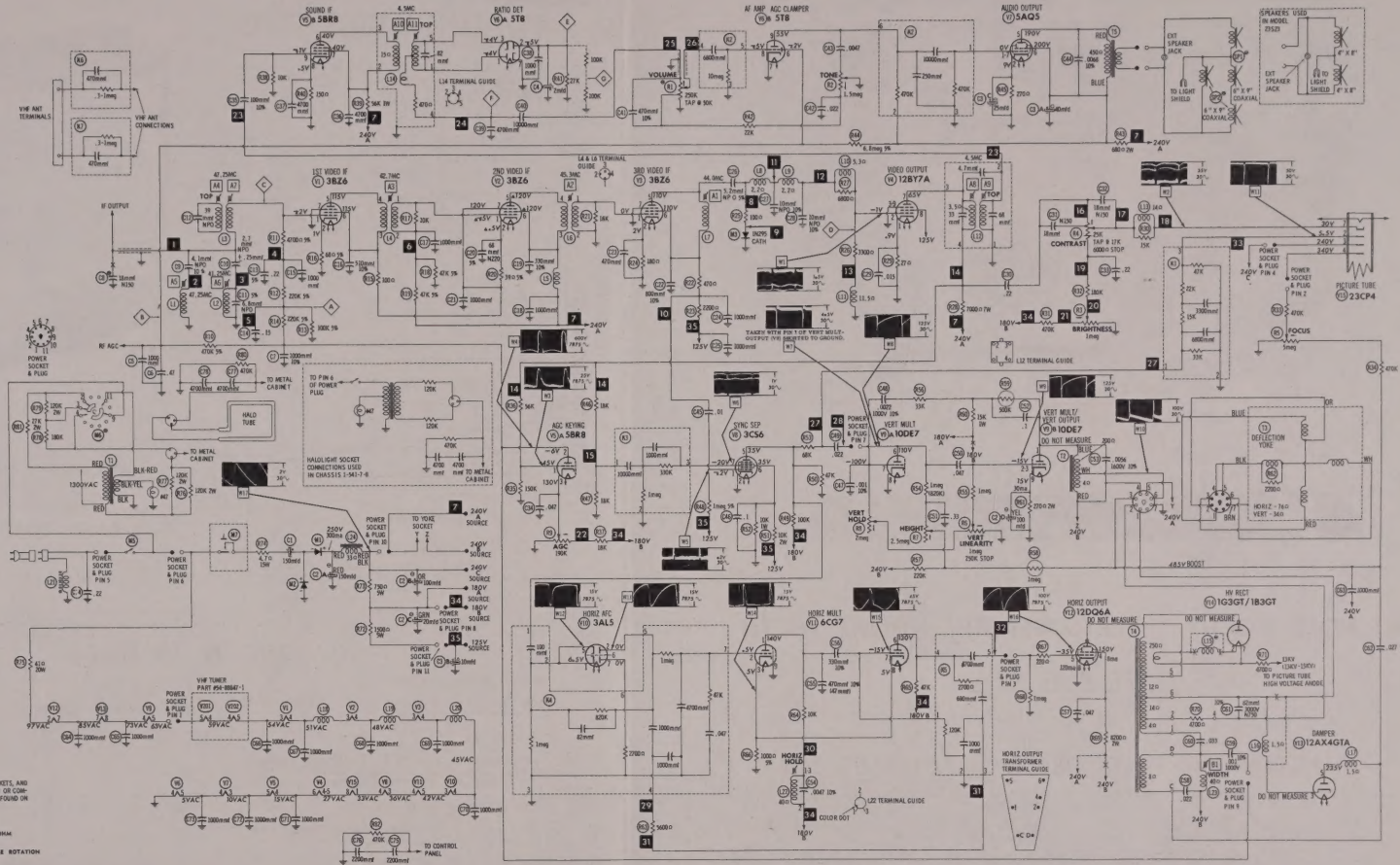
JA706

SYLVANIA MODELS
23S23, 23S24M (Ch. 1-541-7, -8, -9, -0)
SET 472 FOLDER 1


SOUND IF V5 6SR8
RATIO DET V6 6T8
AF AMP AGC CLAMPER V7 6T8
AUDIO OUTPUT V7 6AQ5
SPEAKERS USED IN MODEL 23523
VHF ANT TERMINALS
VHF ANT CONNECTIONS
IF OUTPUT
1ST VIDEO IF V1 3BZ6
2ND VIDEO IF V2 3BZ6
3RD VIDEO IF V3 3BZ6
VIDEO OUTPUT V4 12BY7A
L4 & L6 TERMINAL GUIDE
L12 TERMINAL GUIDE
L14 TERMINAL GUIDE
L22 TERMINAL GUIDE
VOLUME
TONE
CONTRAST
BRIGHTNESS
FOCUS
PICTURE TUBE V13 23CP4
RF AGC
AGC KEYING V6 6SR8
SYNC SEP V8 3CS6
VERT MULT/VERT OUTPUT V9 10DE7
VERT HOLD
HEIGHT
VERT LINEARITY
DEFLECTION YOKE
HORIZ AFC V10 3AL5
HORIZ MULT V11 6CG7
HORIZ OUTPUT V12 12DQ6A
HV RECT V11 1G3GT/1B3GT
DAMPER V12 12AX4GTA
HORIZ HOLD
COLOR
WIDTH
HALO TUBE
VHF TUNER PART #54-88647-1
TO METAL CABINET
TO YOKE SOCKET
TO CONTROL PANEL
HALOLIGHT SOCKET CONNECTIONS USED IN CHASSIS 1-541-7-8
TAKEN WITH PIN 7 OF VERT MULT-OUTPUT IVO GROUNDED TO GROUND.
485V BOOST
DO NOT MEASURE
TO PICTURE TUBE HIGH VOLTAGE ANODE
HORIZ OUTPUT TRANSFORMER TERMINAL GUIDE
POWER SOCKET & PLUG PIN 1
POWER SOCKET & PLUG PIN 2
POWER SOCKET & PLUG PIN 3
POWER SOCKET & PLUG PIN 4
POWER SOCKET & PLUG PIN 5
POWER SOCKET & PLUG PIN 6
POWER SOCKET & PLUG PIN 7
POWER SOCKET & PLUG PIN 9
POWER SOCKET & PLUG PIN 10
POWER SOCKET & PLUG PIN 11
POWER SOCKET & PLUG PIN 12
TO PIN 6 OF POWER PLUG
97VAC
85VAC
73VAC
69VAC
54VAC
51VAC
48VAC
45VAC
5VAC
10VAC
15VAC
27VAC
33VAC
50VAC
42VAC
1300VAC
ADDITIONAL SCHEMATICS PAGE
VHF TUNER 323-0099154-88647-1) 5
VHF TUNER 323-0099154-89093-1) 7
UHF TUNER 323-0099154-84675-1) 6
VHF TUNER WITH UHF PREVIEWERS 323-0099154-88647-2) 18
▲ MEASURED FROM PIN 7 OF V2.
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured at 1000 ohms per volt.
2. Pin numbers are counted in clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line Voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied.
A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE
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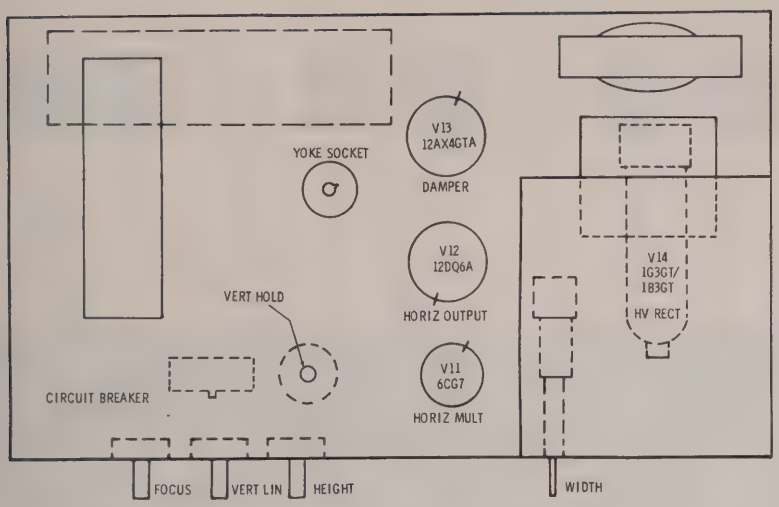
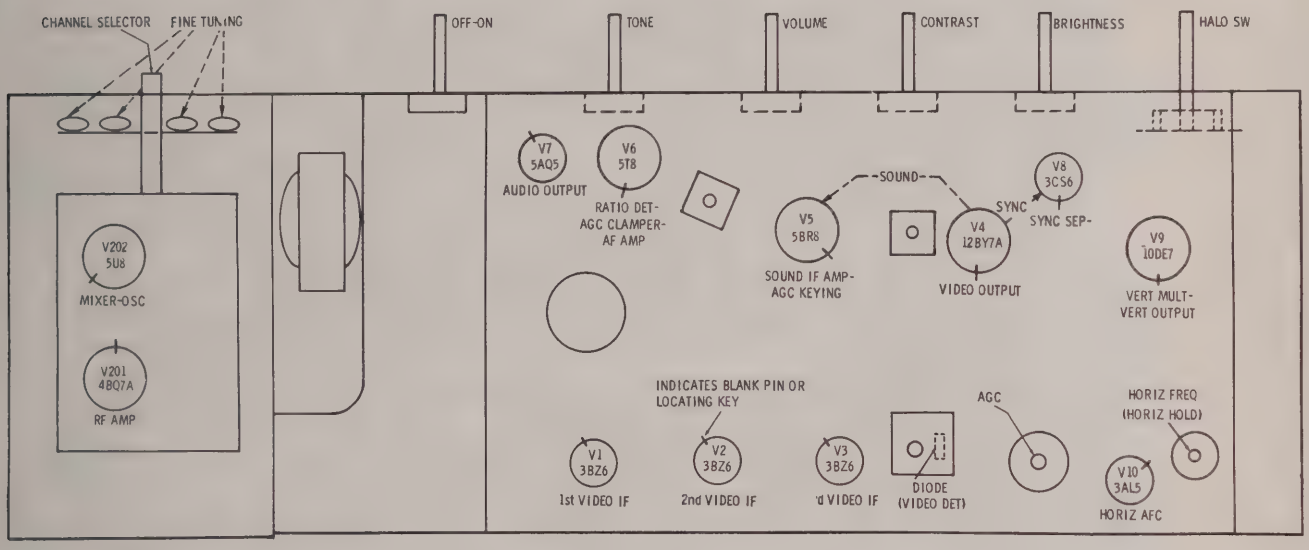
SYLVANIA MODELS
23523, 23524M (Ch. 1-541-7, -8, -9, -0)

TUBE PLACEMENT CHART



TOP VIEW



SYLVANIA MODELS
23523, 23524M (Ch. 1-541-7, -8, -9, -0)

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

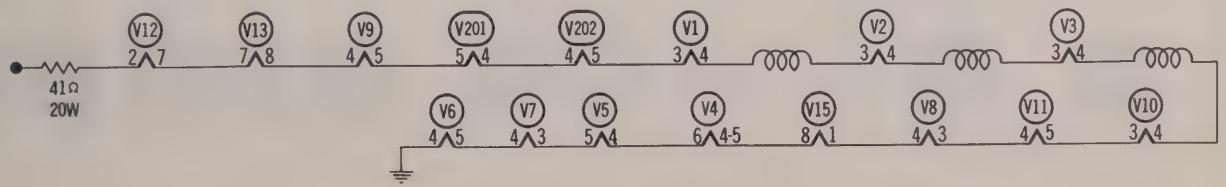
POWER SUPPLY FAILURE
No raster, no sound Rect. (B+), Circuit Breaker

SWEEP FAILURE
No raster, has sound V11, V12, V13, V14, V15
No vertical deflection V9
Poor vert. linearity or foldover V9
Poor horiz. linearity or foldover V11, V12, V13
Narrow picture V11, V12, V13, Rectifiers (B+)
Vert. off freq. V9
Horiz. off freq. V10, V11

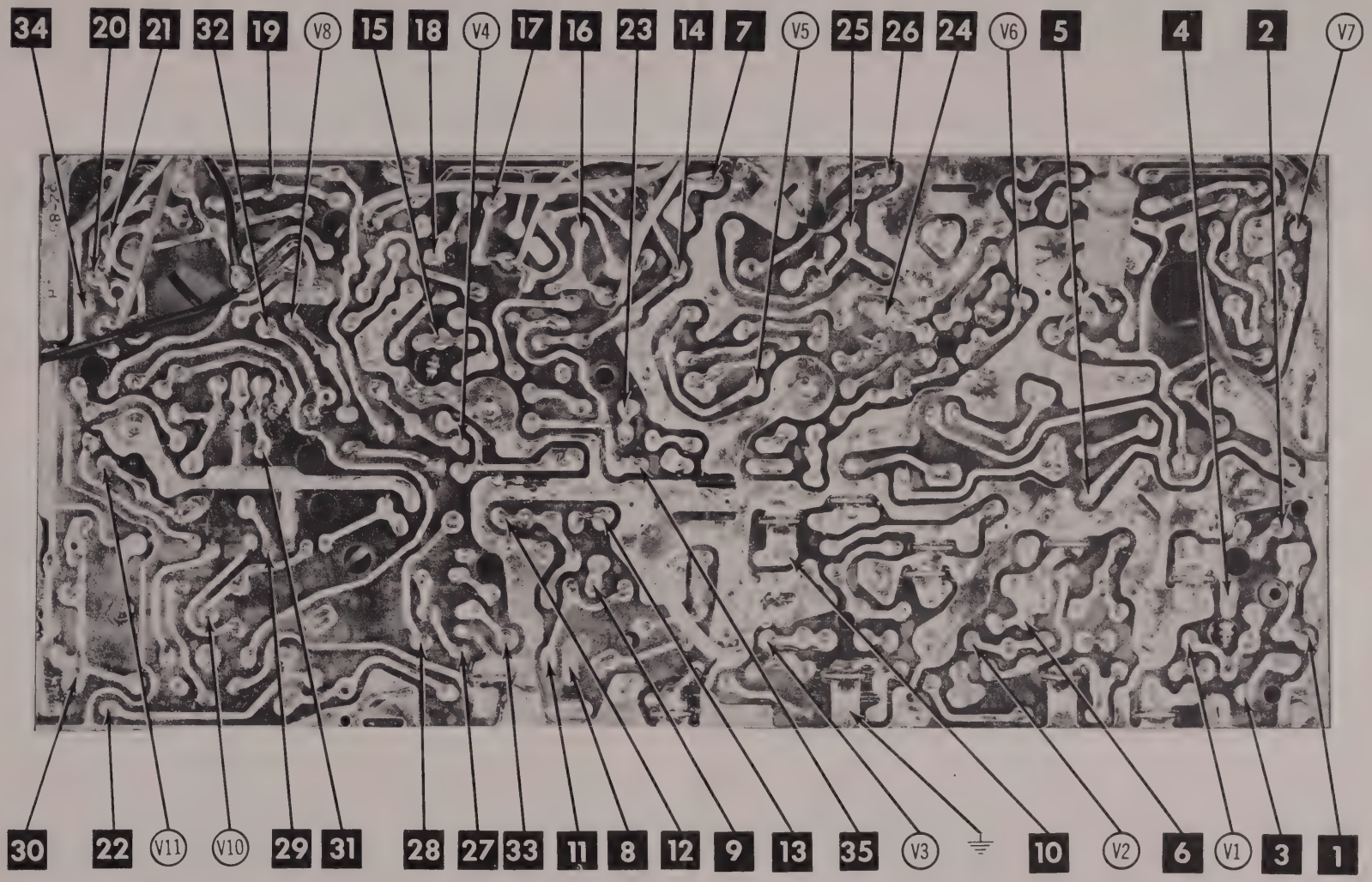
LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, V3, Diode (Video Det.), V4
No pic, no sound, has snow V201, V202, V1
No pic, has sound, has raster V4, V15
Has pic, no sound V5, V6, V7
Overloaded picture V5, V6

SYNC FAILURE
No vert. sync V8
No horiz. sync V8, V10
No vert. or horiz. sync V8

This receiver employs tubes used in a series filament network, an open filament in any tube will cause the set to be inoperative. (See circuit below.)



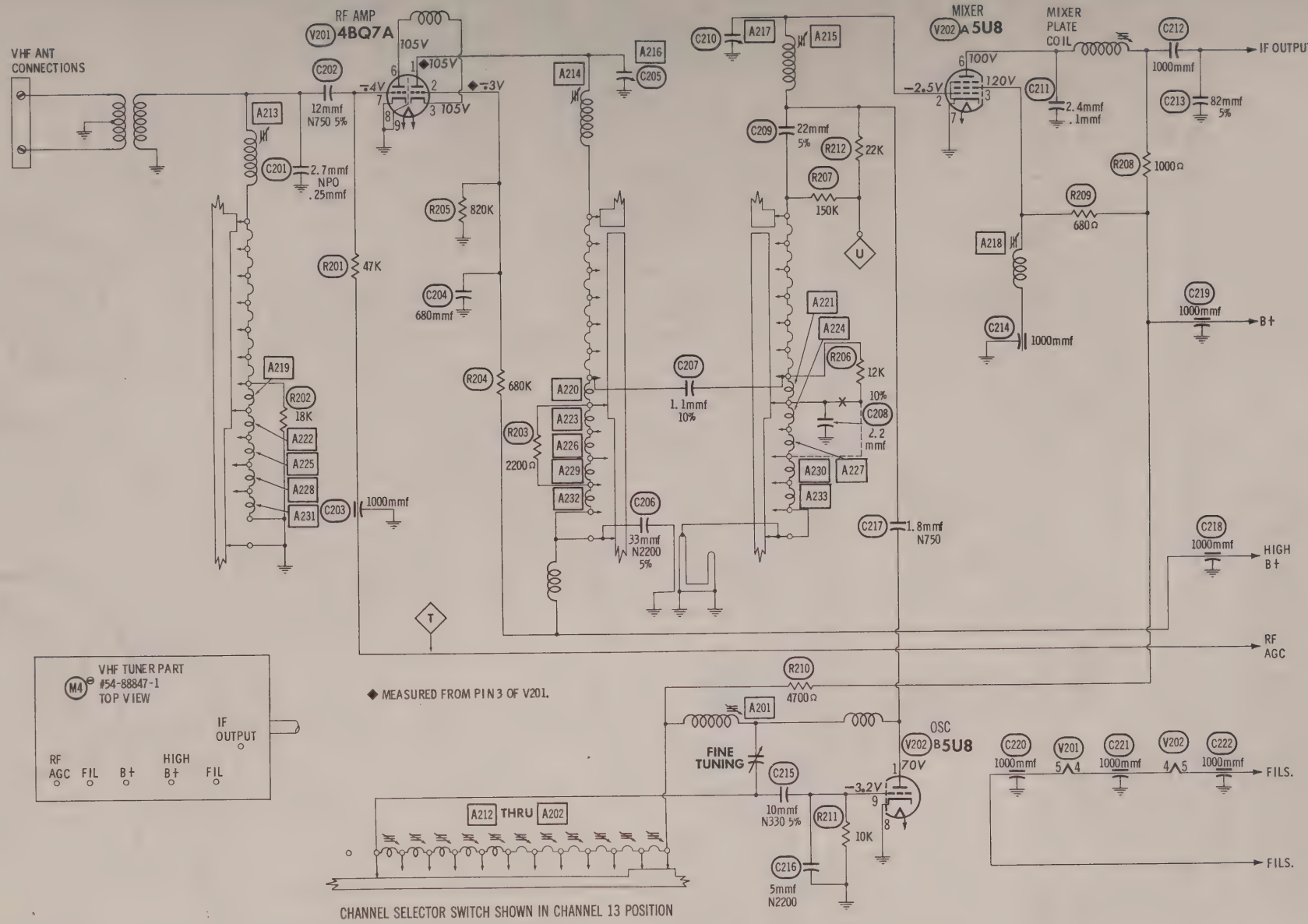
FOLDER 1



A Howard W. Sams CIRCUITRACE® Photo

PRINTED BOARD

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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VHF TUNER 323-0097 (54-88847-1)

SYLVANIA MODELS 2352-3, 2352-4M (Ch. 1-541-7, -8, -9, -0)

TUNER ALIGNMENT INSTRUCTIONS

323-0097, 323-0098

PRE-ALIGNMENT INSTRUCTIONS

Use an ISOLATION TRANSFORMER TO PROTECT the Test Equipment.
The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: GENERAL CEMENT #8607, 9291
WALSCO #2520, 522, 523, 524, 2537

VHF OSCILLATOR ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the Fine Tuning to the center of its range.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Connect variable bias to IF AGC line. Adjust bias to obtain response curve which shows no indication of overloading.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC	215.75MC	13	Vert. Amp. thru 47K across Video Det. load.	A201	Adjust to place sound marker in trap notch as in Fig. 201.
			207MC	209.75MC	12		A202	
			201MC	203.75MC	11		A203	
			195MC	197.75MC	10		A204	
			189MC	191.75MC	9		A205	
			183MC	185.75MC	8		A206	
			177MC	179.75MC	7		A207	
			85MC	87.75MC	6		A208	
			79MC	81.75MC	5		A209	
			69MC	71.75MC	4		A210	
			63MC	65.75MC	3		A211	
			57MC	59.75MC	2		A212	

VHF RF AND MIXER ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Coils not containing adjustable cores adjusted by expanding or compressing coil turns.
Connect the negative lead of a 2.5 volt bias supply to point (T). Positive to chassis.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
2.	Two 120Ω Carbon Resisors	Across antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 47K to point (U). Low side to chassis.	A213, A214, A215	Adjust for maximum gain and symmetry of response similar to Fig. 202 with markers as shown. A213 is adjusted for maximum gain. A214 and A215 position markers. Bandwidth is varied by positioning of lead of C206 with respect to chassis.
3.	"	"	177MC	175.25MC 179.75MC	7	"	A216, A217, A218	Adjust for maximum gain and symmetry of response similar to Fig. 202 with markers as shown. Repeat steps 2 and 3. If dip is excessive, spread coil turns of A218.
4.	"	"	85MC	83.25MC 87.75MC	6	"	A219, A220, A221	Adjust in numerical order for maximum gain or symmetry similar to Fig. 202. 1st coil is adjusted for maximum gain, the other two position markers. Bandwidth is varied by positioning lead of C207.
5.	"	"	79MC	77.25MC 81.75MC	5	"	A222, A223, A224	"
6.	"	"	69MC	67.25MC 71.75MC	4	"	A225, A226, A227	"
7.	"	"	63MC	61.25MC 65.75MC	3	"	A228, A229, A230	"
8.	"	"	57MC	55.25MC 59.75MC	2	"	A231, A232, A233	"
9.	.001mfd	High side to point (V). Low side to chassis.	44MC	41.25MC 45.75MC	UHF	"	A234, A235, A236	UHF Models only. Adjust for maximum gain and symmetry of response similar to Fig. 202. with markers as shown. Proximity of A236 and A237 controls bandwidth.

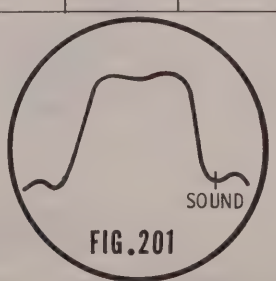


FIG. 201

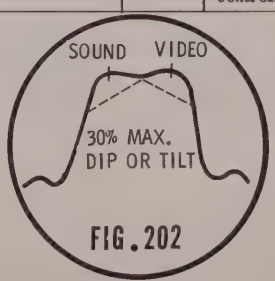
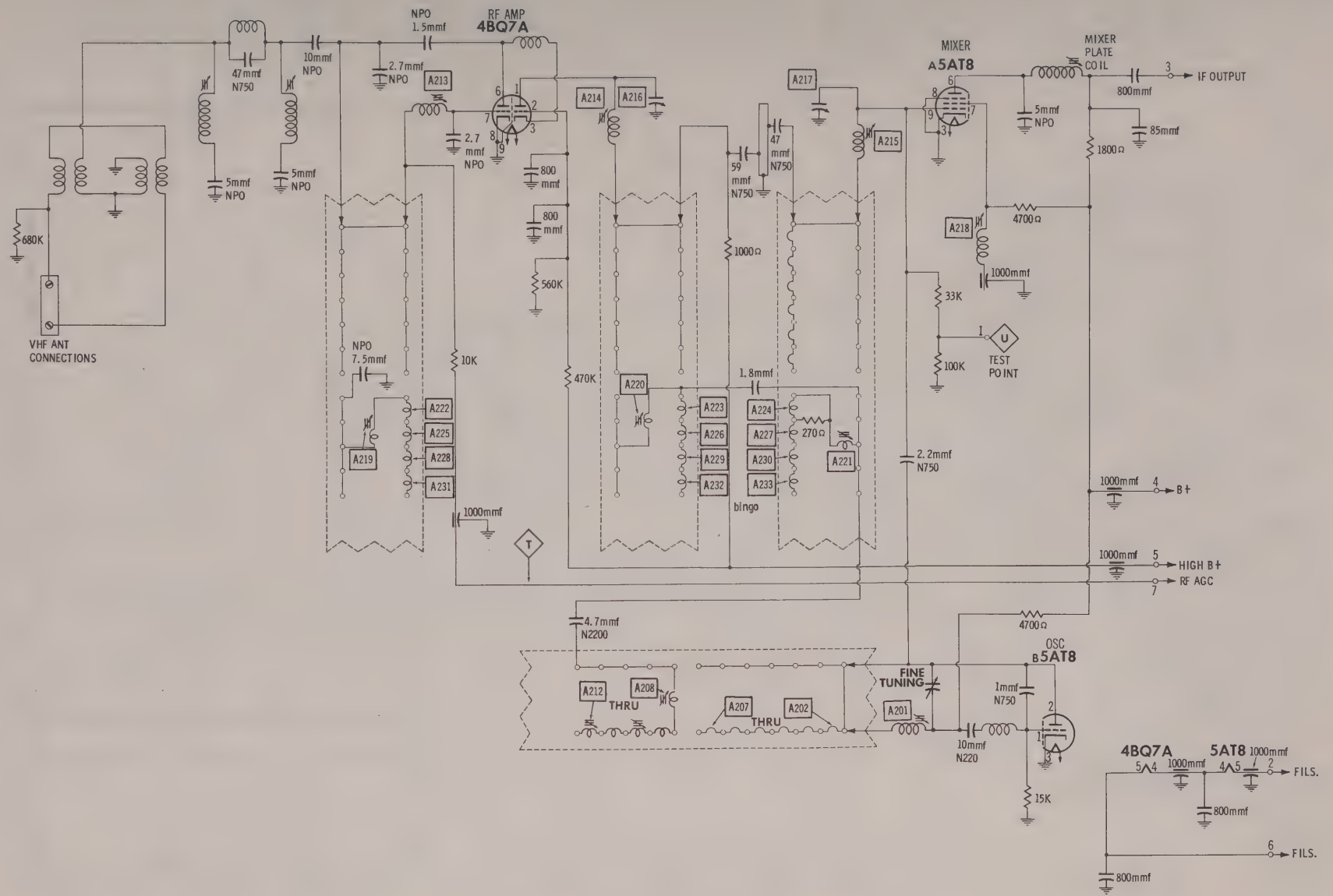


FIG. 202



A PHOTOFACT STANDARD NOTATION SCHEMATIC

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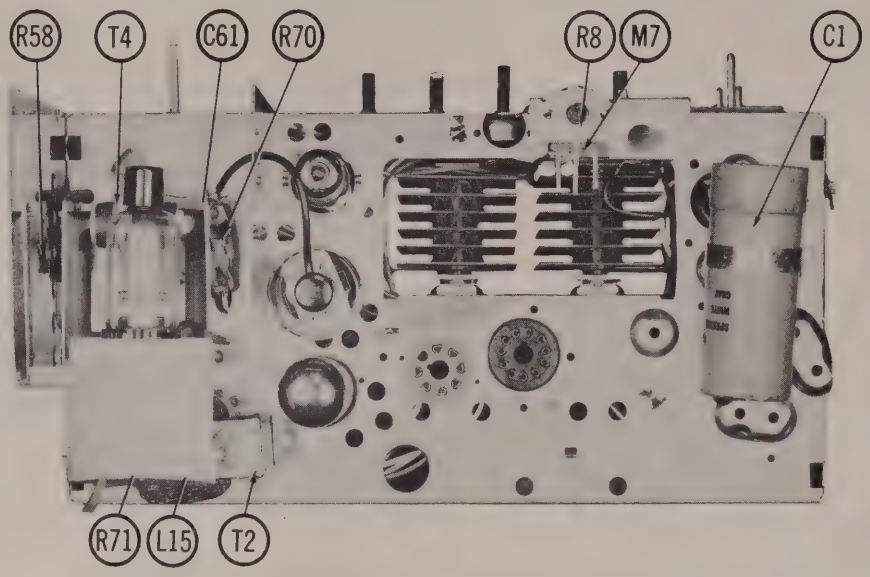
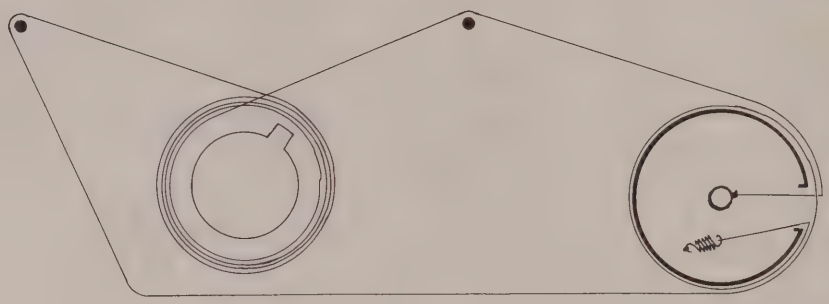
VHF TUNER 323-0097 (54-89093-1)

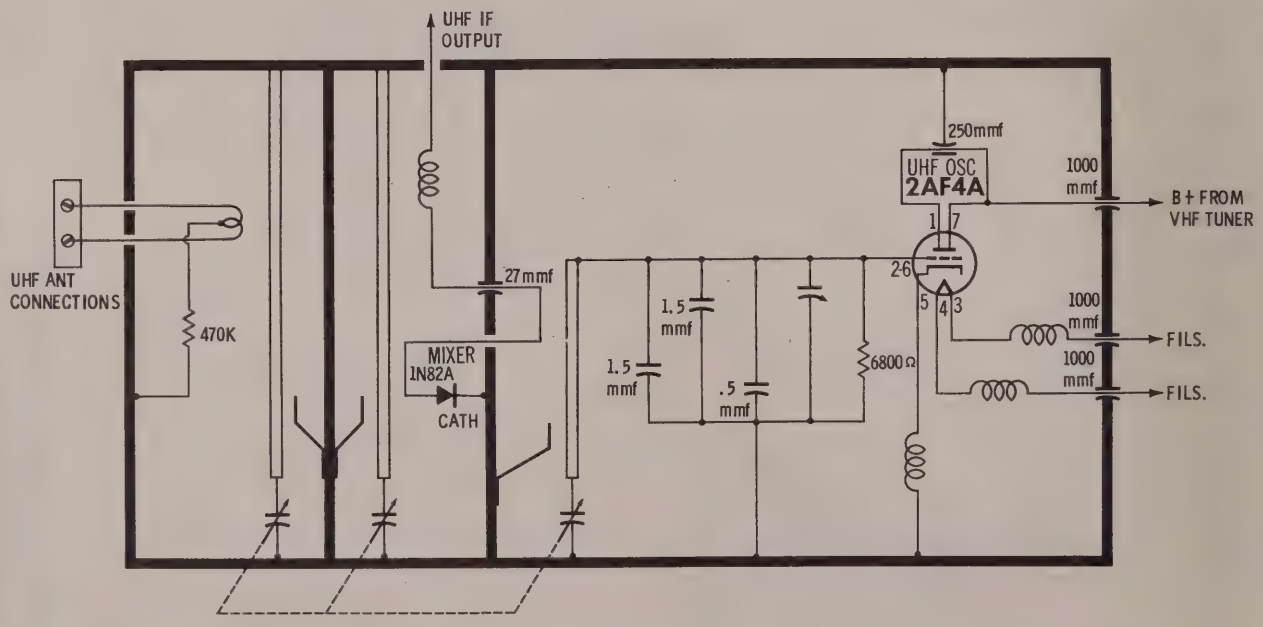
SYLVANIA MODELS 2352-3, 2352-4M (Ch. 1-541-7, -8, -9, -0)



POWER & SWEEP CHASSIS — TOP VIEW



UHF DIAL CORD STRINGING



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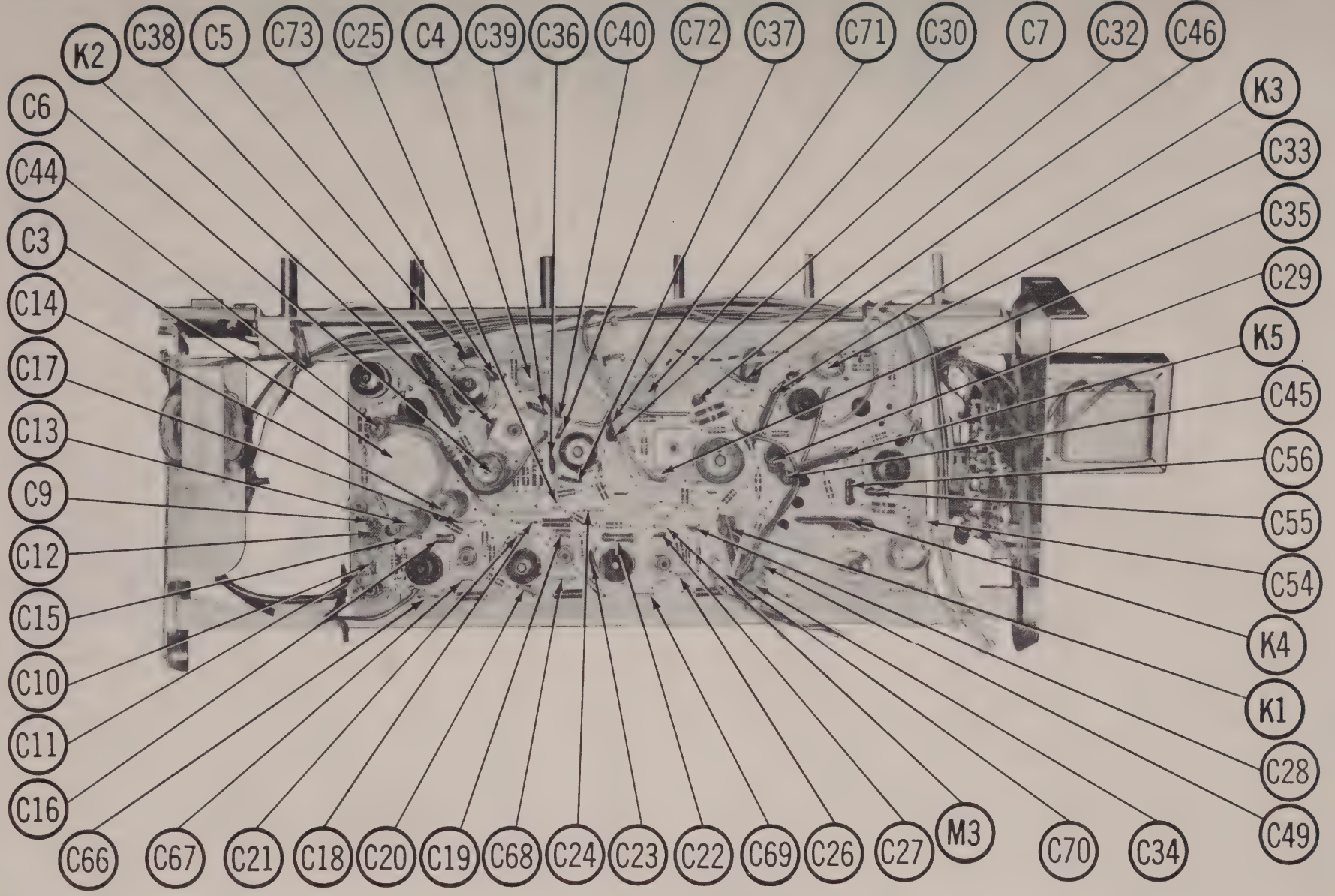
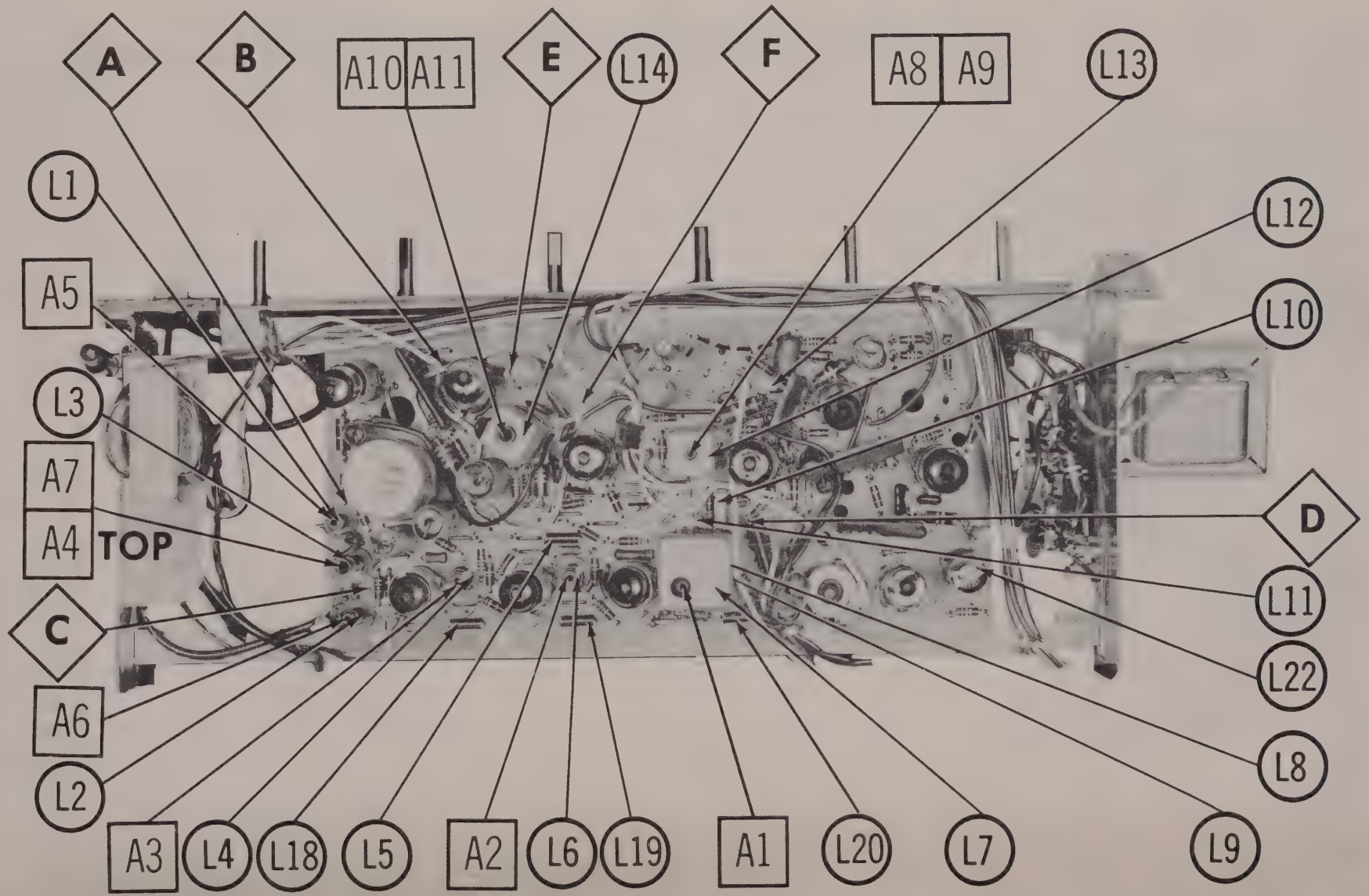
UHF TUNER 232-0099(54-84679-1)



MAIN CHASSIS TOP VIEW - CAPACITOR & MISC. IDENT.



MAIN CHASSIS TOP VIEW - ALIGNMENT & INDUCTOR IDENT.

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Use an ISOLATION TRANSFORMER TO PROTECT the Test Equipment.
The High Voltage leadshould be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: GENERAL CEMENT # 8282, 8606, 8606L, 9295
WALSCO #2526, 2543, 2544, 2545

VIDEO IF ALIGNMENT

Connect the negative lead of a 3.5 volt bias supply to point (A). Positive to chassis.
Connect the negative lead of a 25 volt bias supply to point (B). Positive to chassis.
If a separate marker generator is used, couple loosely to sweep generator output. Use low marker output. Keep all leads of generator and scope shielded and short as possible.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Detune Mixer Plate Coil by turning core fully counterclockwise. Detune A5.

	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	High side thru .0047 mfd to point (C). Low side to chassis.	43.5MC (10MC Swp)	42.6MC 45.75MC	Any non-interfering channel	Vert. Amp. thru 33K to point (D). Low side to chassis. (Across Video Det. load)	A1, A2, A3	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. A1 controls top of curve. A2 controls placement of 45.75MC marker and A3 controls placement of 42.6MC marker.
2.	Place a thin insulated metal strip between the Mixer-Osc. tube (V202) and tube shield. Connect the high side of sweep generator to the metal strip. Low side to chassis.	"	47.25MC	"	"	A4, A5	Adjust for MINIMUM response at 47.25MC marker as in Fig. 2.
3.	"	"	41.25MC	"	"	A6	Adjust to place marker in trap notch as in Fig. 2.
4.	"	"	42.6MC 45.75MC	"	"	Mixer Plate Coil & A7	Adjust for maximum gain and symmetry of response similar to Fig. 2 with markers as shown.

4.5MC TRAP ALIGNMENT

Set Contrast fully clockwise.
Set Brightness fully counterclockwise.
Connect the negative lead of a 30 volt bias supply to point (A). Positive to chassis.
Connect a 4.5MC series tuned trap between pin 7 (cathode) of picture tube and chassis.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
5.	High side thru .0047 mfd to point (D). Common to chassis. (Across Video Det. load)	4.5MC (Unmod)	Any non-interfering channel	RF probe across coil of 4.5MC series tuned circuit.	A8	Adjust for MINIMUM deflection.

ALTERNATE 4.5MC TRAP ALIGNMENT USING AIR SIGNAL

Tune in a strong TV signal and set Contrast at maximum. Adjust the Fine Tuning until a beat pattern is visible. Adjust A8 for MINIMUM beat interference.

SOUND IF ALIGNMENT

Connect two matched 100K (±1%) resistors in series from point (E) to chassis. The junction of these two resistors is alignment point (G) as shown on the schematic.
Connect the negative lead of a 30 volt bias supply to point (A). Positive to chassis.
Set Contrast fully clockwise.
Set Brightness fully counterclockwise.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
6.	High side thru .0047 mfd to point (D). Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	DC probe thru 100K to point (E). Common to chassis.	A9, A10	Adjust for maximum deflection.
7.	"	"	"	DC probe thru 100K to point (F). Common to point (G).	A11	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

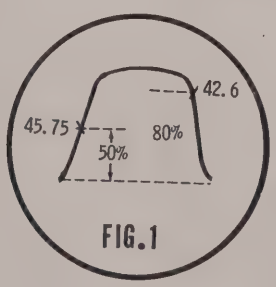


FIG. 1

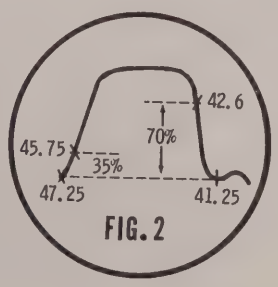


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No	USE	TYPE	ITEM No	USE	TYPE
V1	1st Video IF Amp.	3BZ6	V8	Sync Sep	3CS6
V2	2nd Video IF Amp.	3BZ6	V9	Vert Mult.-Vert Output	10DE7
V3	3rd Video IF Amp.	3BZ6	V10	Horiz AFC	3AL5
V4	Video Output	12BY7A	V11	Horiz Mult	8CG7
V5	AGC Keying-Sound IF Amp.	5BR8	V12	Horiz Output	12DQ6A
V6	Ratio Det.-AF Amp.- AGC Clamper	5T8	V13	Damper	12AX4GTA
V7	Audio Output	5AQ5	V14	HV Rect.	1B3GT

PICTURE TUBE

ITEM No	REPLACEMENT DATA					NOTES
	SYLVANIA PART No	GENERAL ELECTRIC PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
V15	23CP4				23CP4 ①	① "Silver Screen 85"

ELECTROLYTIC CAPACITORS

ITEM No	RATING CAP	RATING VOLT	SYLVANIA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1	150	200	181-1035	PRU-100	XAD318	WB437	TD-200-200	TVA8-1647 *	
C2A	150	300		PR4-300	D0025	WQ403		TVA8-4580 *	Note 1
B	100	300			BBR100-25				
C	30	300							
D	100	25							
C3A	ø40	350	181-3039	PWE3-110-30		TC73764		PCLS-3636.10*	
B	ø10	350							
C	ø25	25							
C4	2	50	181-1041	PRB300	BBR2-50	TC302	TD-2-50	TVA-1301	

Note 1. Some versions may use 4 section (150mfd ② 350V, 100mfd ③ 350V, 20mfd ④ 350V, 100mfd ⑤ 25V (Part#181-4024).
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No	RATING	REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C6	47 100V		P288N-47		CUB42P47	2DP-5-474	GEM-4047	4TM-P47
C7	1000 10%		DI-1000	DD-102	PM6DI	CCD-102	GP210	10TS-D10
C8	18 N150	Note 1			"	"	"	10TCP-Q18
C9	4 1 NPO 10%		NPO-DI 4.7	DTZ-4R7	C10V4C	CCTO-4R7	CNO-547	10TCC-V47
C10	2.7 NPO ± .25mmf							10TCC-V27
C11	6.8 NPO 5%		NPO-DI 6.8	DTZ-6R8	C10V68C	CCTO-6R8	CNO-568	10TCC-V68
C12	39 NPO 5%		NPO-DI 39	TCZ-39	C10Q39C	CCTO-390	CNO-439	10TCC-Q39
C13	22 100V		P288N-22		CUB2P22	1DP-1-224	GEM-2122	2TM-P22
C14	15 200V		P288N-15		CUB2P15	2DP-3-154	GEM-3015	2TM-P15
C15	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C16	510 10%			DD-511	22R5T51	CM-20B-511K	GP350	MS-515
C17	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C18	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C19	330 10%			DD-331	22R5T33	CM-20B-331K	GP333	10TCS-Q33
C20	68 N220 5%					"		10TCS-Q68
C21	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C22	800 10%			DD-801	1R5T8	CCD-821	GP382	10TS-P80
C23	470		BPD-00047	DD-471	BYA10T47	CCD-471	GP347	10TS-T47
C24	1000		BPD-001	DD-102	BYA10D1	CCD-471	GP210	5HK-D10
C25	1000		BPD-001	DD-102	BYA10D1	CCD-471	GP210	5HK-D10
C26	5 2 NPO 5%		NPO-DI 5	DTZ-4R7	C10V5C	CCTO-050	CNO-547	10TCC-V5
C27	10 NPO 10%		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C28	10 NPO 10%		NPO-DI 10	DTZ-10	C10Q1C	CCTO-100	CNO-410	10TCC-Q10
C29	015 200V		P288N-015	DD-153	PM4DI5	4DP-1-153	GEM-4115	4TM-S15
C30	22 400V		P488N-22		CUB4P22	4DP-5-224	GEM-4022	4TM-P22
C31	18 N150				"	"	"	10TCP-Q18
C32	18 N150				"	"	"	10TCP-Q18
C33	22 400V		P488N-22		CUB4P22	4DP-5-224	GEM-4022	4TM-P22
C34	047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C35	100 10%		1469-0001	TCZ-100	22R5T1	CM-20B-101K	MCB235	MS-31
C36	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	GP347	5HK-D47
C37	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	GP347	5HK-D47
C38	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C39	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	GP347	5HK-D47
C40	10000		BPD-01	DD-103	BYA10S1	CCD-103	GP110	5HK-S10
C41	470 10%		1469-00047	DD-471	5R5T47	CM-20B-471K	MCJ344	MS-347
C42	022 400V		P488N-022	DD-203	CUB4S22	4DP-2-333	GEM-4122	4TM-S22
C43	.0047 600V		P888N-0047	DE-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C44	.0068 600V 10%		V84C18D68-10%		PM6D68	6DP-1-682	GEM-16268	6TM-D68
C45	.01 400V		P488N-01	DE-103	CUB4S1	4DP-1-103	GEM-411	4TM-S1
C46	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C47	.001 600V 10%		V84C6D1-10%	DD-102	PM6DI	6DP-1-102	GEM-1621	6TM-DI
C48	.0022 1000V 10%					16DP-2-222	GEM-16122	10TM-D22
C49	.022 400V		P488N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C50	047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C51	.33 400V		P488N-33		CUB4P33		GEM-4033	4TM-P33
C52	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C53	.0056 1800V 10%						GEM-16256	
C54	.0047 400V 10%		V84C6D47-10%		CUB6D47	6DP-1-473	GEM-16247	6TM-D47
C55	470 10%		1469-00047	DD-471	5R5T47	CM-20B-471K	GP347	MS-347
C56	330 10%		1469-00033	DD-331	5R5T33	CM-20B-331K	GP333	MS-333
C57	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C58	.022 200V		P288N-022	DD-203	CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C59	.001 1000V 10%		P1064CM-0012	DD-102		16DP-1-102	GEM-1621	10TM-DI
C60	.033 600V		P588N-033	DD-303	CUB6S33	6DP-1-333	GEM-6133	6TM-S33
C61	82 3000V N750 10%	#169-0061						
C62	.027 600V 10%		P584CM-027		PM6S3	6DP-3-273	GEM-1613	6TM-S3
C63	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C64	1000		BPD-001	DD-103	BYA10D1	CCD-102	GP210	5HK-D10
C65	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C66	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C67	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C68	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C69	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C70	1000		BPD-001	DD-103	BYA10D1	CCD-102	GP210	5HK-D10

FIXED CAPACITORS (cont)

ITEM No	RATING	REMARKS	REPLACEMENT DATA: AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C71	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C72	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C73	1000		BPD-001	DD-102	BYA10D1	CCD-102	GP210	5HK-D10
C74	22 400V		P488N-22		CUB4P22	4DP-5-224	GEM-4022	4TM-P22
C75	2200		BPD-0022	DD-222	BYA10D22	CCD-222	GP222	5HK-D22
C76	2200		BPD-0022	DD-223	BYA10D22	CCD-222	GP222	5HK-D22
C77	4700		BPD-0047	DD-473	BYA10D47M	CCD-472	GP247	5HK-D47
C78	4700		BPD-0047	DD-472	BYA10D47M	CCD-472	GP247	5HK-D47

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
• Sylvania Part No. Note 1. Not used in some versions.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA: SYLVANIA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	250K	1	153-0162	BT-54	A47F-250K	Q18-130X	UT-430	Volume Note 1
	500K tap							
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R2A	1.5meg	½	153-0163	B-76	A47-1.5meg-S	B13-138	RU155A	Tone
B	Shaft				FS-3	SIG	SL-3500	
C	Bushing				Not Req.	Not Req.	SL-38	
R3A	1meg	½	153-0169	B-89	A47-1meg-S	Q11-137	U54	Brightness
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R4	25K	½	153-0170					Contrast
	17K tap							
	6000ohmstop							
R5A	5meg	½	153-0200	AB-87	B47-5meg-S	B11-141	PTA56L	Focus
B	Shaft			AK-18	Not Req.	TM4	Not Req.	
R6A	1meg	½	153-0137	AB-69 *	B47-1meg-S*	B11-137 *	SU-54 *	Vert. Lin.
B	Shaft			AK-19	Not Req.	TM4	Not Req.	
	250K stop							
R7A	2.5meg	½	153-0125	AB-83	B47-2.5meg	B11-239	SU-585	Height
					-S			
B	Shaft			AK-19	Not Req.	TM4	Not Req.	
R8A	2meg	½	153-0159	AB-75	B47-2meg-S	B11-139	PTA26L	Vert. Hold
B	Shaft			AK-19	Not Req.	TM4	Not Req.	
R9	100K	½	153-0179					AGC

Note 1. Chassis 1-541-7, -8 use 250K Volume with switch (Part #153-0168)
* Use 270K resistor in series with right hand terminal viewed from shaft end, terminals down.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS	ITEM No.	RATING	REMARKS	ITEM No.	RATING	REMARKS
R10	470K 5%		R35	150K		R60	15K 1W	
R11	4700Ω 5%		R36	56K		R61	2700 2W	
R12	220K 5%		R37	18K		R62	2200Ω	
R13	100K 5%		R38	10K		R63	5800Ω	
R14	330K 5%		R39	56K 1W		R64	10K	
R15	100Ω		R40	150Ω		R65	47K	
R16	68Ω 5%		R41	27K		R66	1000Ω 5%	
R17	10K		R42	22K		R67	220Ω	
R18	47K 5%		R43	680Ω 2W		R68	1meg	
R19	47K 5%		R44	6.8meg 5%		R69	8200Ω 2W	
R20	33Ω 5%		R45	270Ω		R70	4700Ω	
R21	18K		R46	18K		R71	4700Ω	
R22	470Ω		R47	18K		R72	1500Ω 5W	#187-0021
R23	2200Ω		R48	1meg 5%		R73	750Ω 5W	#187-0056
R24	180Ω		R49	100K		R74	4.7Ω 15W	#187-0034
R25	100Ω		R50	47K		R75	41Ω 20W	#187-0067
R26	3300Ω		R51	10K 2W		R76	120K 2W	
R27	6800Ω		R52	10K 1W		R77	130K 2W	
R28	7000Ω 7W	#189-0088	R53	68K		R78	180K	
R29	27Ω		R54	1meg (820K)*		R79	120K 2W	
R30	15K		R55	1meg		R80	470K	
R31	470K		R56	33K		R81	27K 2W	
R32	180K		R57	220K		R82	470K	
R33	470K		R58	1meg (Cold)	#189-0082			
R34	470K		R59	500K (Cold)	#189-0081			

* Alternate value. # Sylvania Part No.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA: SYLVANIA PART No.	Cromer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	47.25MC Trap	130-0026						
L2	41.25MC Trap	130-0025						
L3A	1st Video IF	119-0024						
B	47.25MC Trap							
L4	2nd Video IF	125-0006						
L5	RF Choke	118-0032	19-1000	19-1000	BC-561	4602		1.2uh
L6	3rd Video IF	125-0006						
L7	4th Video IF	130-0026						
L8	RF Choke	118-0020	19-2864	19-2864	BC-566	4612		10.8uh
L8	RF Choke	118-0020	19-2864	19-2864	BC-566	4612		10.8uh
L10	Series Peaking Coil	131-2036	19-3075	19-3075		6172	VP-2	66uh
L11	Shunt Peaking Coil	131-2033	19-3330	19-3330	TV-300	6132	VP-7	330uh
L12A	Sound Take-off	130-0023						
B	4.5MC Trap							
L13	Series Peaking Coil	131-2037	19-3375	19-3375	TV-301	6134	VP-7	368uh
L14	Ratio Detector	137-0002						Note 1
L15	RF Choke							
L16	RF Choke	118-0010	19-1005	19-1005	BC-566	4612		
L17	RF Choke	118-0010	19-1005	19-1005	BC-566	4612		
L18	Fil. Choke	118-0032	19-1000	19-1000	BC-561	4602		1.2uh
L19	Fil. Choke	118-0032	19-1000	19-1000	BC-561	4602		1.2uh
L20	Fil. Choke	118-0032	19-1000	19-1000	BC-561	4602		1.2uh
L21	Line Choke	145-0030	19-1015	19-1015		4631		

Note 1. Not used in some versions.

TRANSFORMER (HORIZ. OSC.)

ITEM No	DC RES PRI.	DC RES SEC.	REPLACEMENT DATA: SYLVANIA PART No	Halldorson PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Thordarson PART No.	NOTES
L22	40Ω		132-0022						Horiz. Stabilizing

COILS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA: SYLVANIA PART No	Halldorson PART No	Merit PART No	Miller PART No	Ram PART No	Rogers PART No	Stancor PART No	Thordarson PART No	Triad PART No
L23	Width (12-50MH)	132-0021	WC-19	MWC-3	6319				WC-19	WLC-25 1

1 Do not use tap

FILTER CHOKE

ITEM No.	RATINGS CURRENT (Measured)	RATINGS DC RES.	RATINGS INDUCTANCE @ CURRENT 1000 ~(.)	REPLACEMENT DATA: SYLVANIA PART No	Halldorson PART No	Merit PART No	Ram PART No	Stancor PART No	Thordarson PART No	Triad PART No
L24	300A	33Ω	8 Hy	145-0020						C-34X

TRANSFORMER (HALOLIGHT)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA: SYLVANIA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V ② 120A tap @ 6.3V @ .150A	1300V @ .001A		141-0083						

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: SYLVANIA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	Vert Output	241-0045	26S75 ① ②	A-2823 ②	V316 ③ ④		A-8146 ③④	26S75 ①②	A-118X ①
T3	Yoke-Horiz (33MH) (1109-Vert. (29MH) Rear Cover & Centering Device	100-0038 400-0039	Y-46 ⑤ ⑥ ⑦	MDF-110 ⑤ ⑦				Y-46 ⑤ ⑥ ⑦	Y-66 & HW-2 ⑤⑥
	Yoke Clamp	497-0076							
T4	Horiz. Output	241-0049	FLY-148 *	HVO-136 *	X179			FLY-148 *	D-159 *

① Use 8 to 1 turns ratio.
② Connect as autoformer.
③ Cut and tape green lead.
④ Drill new mounting hole(s).
⑤ Requires new rear cover, centering device, and yoke clamping device.
⑥ Use original yoke plug.
⑦ Connect yoke terminal #5 to yoke plug #1, yoke #6 to plug #2, yoke #1 to plug #3
⑧ Remove orange lead from yoke. Connect yoke terminal #3 to yoke plug #1, yoke #1 and #3 to plug #2, yoke #7 to plug #3.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

	ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	Ram Replacement Connections	Rogers Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	5	5	5				5	5
	6	6	6				6	6
	2	2	2				2	2
	1	1	1				1	1
	D	D	D				D	D
	C	C	C				C	C
Connect Width Coil Across →	Term "D" & B+	Term "D" & B+	Term "D" & B+				Term "D" & B+	Term "D" & B+

TRANSFORMER (AUDIO OUTPUT)

ITEM No	IMPEDANCE PRI.	IMPEDANCE SEC	REPLACEMENT DATA: SYLVANIA PART No	Halldorson PART No	Merit PART No	Ram PART No	Stancor PART No	Thordarson PART No	Triad PART No	NOTES
T5	5700Ω	3-4Ω	143-0070	24S51 ①	A-2930 ①	AU-601 ①	A-3877 ①	24S51 ①	S-5X	1 Drill new mounting hole.

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA: SYLVANIA PART No	QUAM PART No	NOTES
SP1	6" x 9"	PM	6-8Ω	539-6906 ①		1 Coaxial, Model 23S23
SP2	6" x 9"	PM	6-8Ω	539-6907 ①		2 Model 23S24
	4" x 8"	PM		539-4803 ②		
	4" x 8"	PM		539-4801 ②		

SYLVANIA MODELS 23S23, 23S24M (Ch. 1-541-7, -8, -9, -0)

FOLDER 1

PARTS LIST AND DESCRIPTIONS (Continued)

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	SYLVANIA PART No.	REPLACEMENT DATA
K1	Vert. Retrace	3300mmf, 6800mmf, 15K, 22K, 33K, 47K	190-0037	
K2	Audio Coupling	250mmf, 6800mmf, 10000mmf, 470K, 470K, 10meg	190-0048	
K3	Sync Sep. Grid	1000mmf, 10000mmf, 330K, 1meg	190-0043	
K4	Horiz. AFC	82mmf, 100mmf, 1000mmf, 1000mmf, 4700mmf, .047mfd, 2700Ω, 47K, 820K, 1meg, 1meg	190-0047	
K5	Horiz. Osc. Grid	680mmf, 1000mmf, 4700mmf, 2700Ω, 120K	190-0050	
K6	Antenna Filter	470mmf, .3-1meg	190-0035	Centralab RC-471 Sprague AC1-1
K7	Antenna Filter	470mmf, .3-1meg	190-0035	Centralab RC-471 Sprague AC1-1

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					
	CURRENT (Measured)	SYLVANIA PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.300A	517-0010	T400	1241AH	400A	SR-500	Selenium Type.
M2	.300A	517-0010	T400	1241AH	400A	SR-500	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		SYLVANIA PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M3	1N295	1N295	1N60	1N295	1N295	Video Det. (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	SYLVANIA PART No.	NOTES
M4	Tuner	323-0097	VHF (54-88847-1)
	Tuner	323-0097	VHF (54-89093-1)
	Tuner	323-0098	VHF with UHF provisions (54-88847-2)
	Tuner	323-0099	UHF (54-84679-1)
M5	Switch	571-0029	Off-On Ch. 1-541-8-0
M6	Switch	571-0030	HaloLight Ch. 1-541-9, -0
	Switch	571-0018	HaloLight Ch. 1-541-7, -8
M7	Circuit Breaker	191-0026	
	Halo Tube	611-2300	

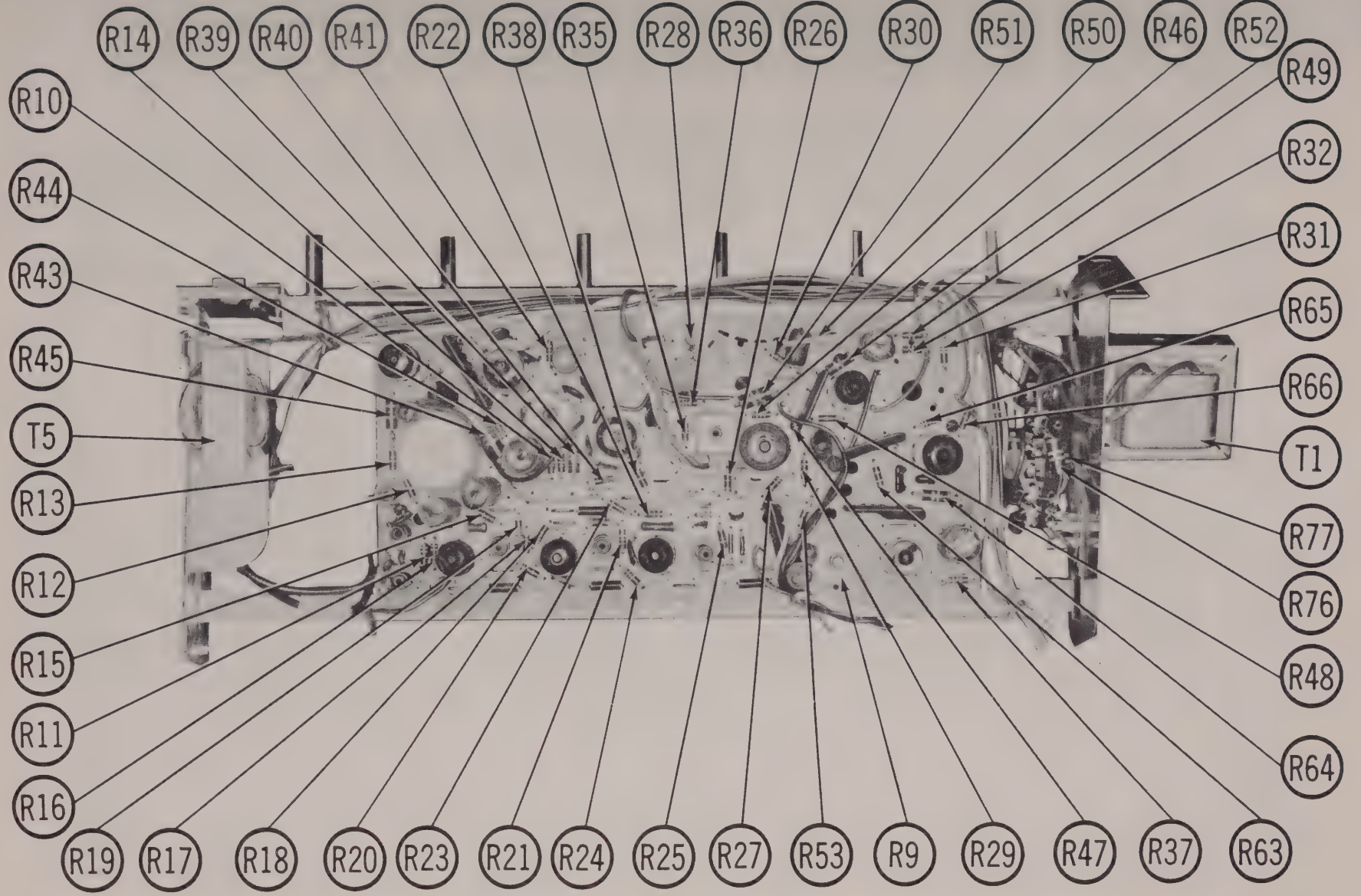
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

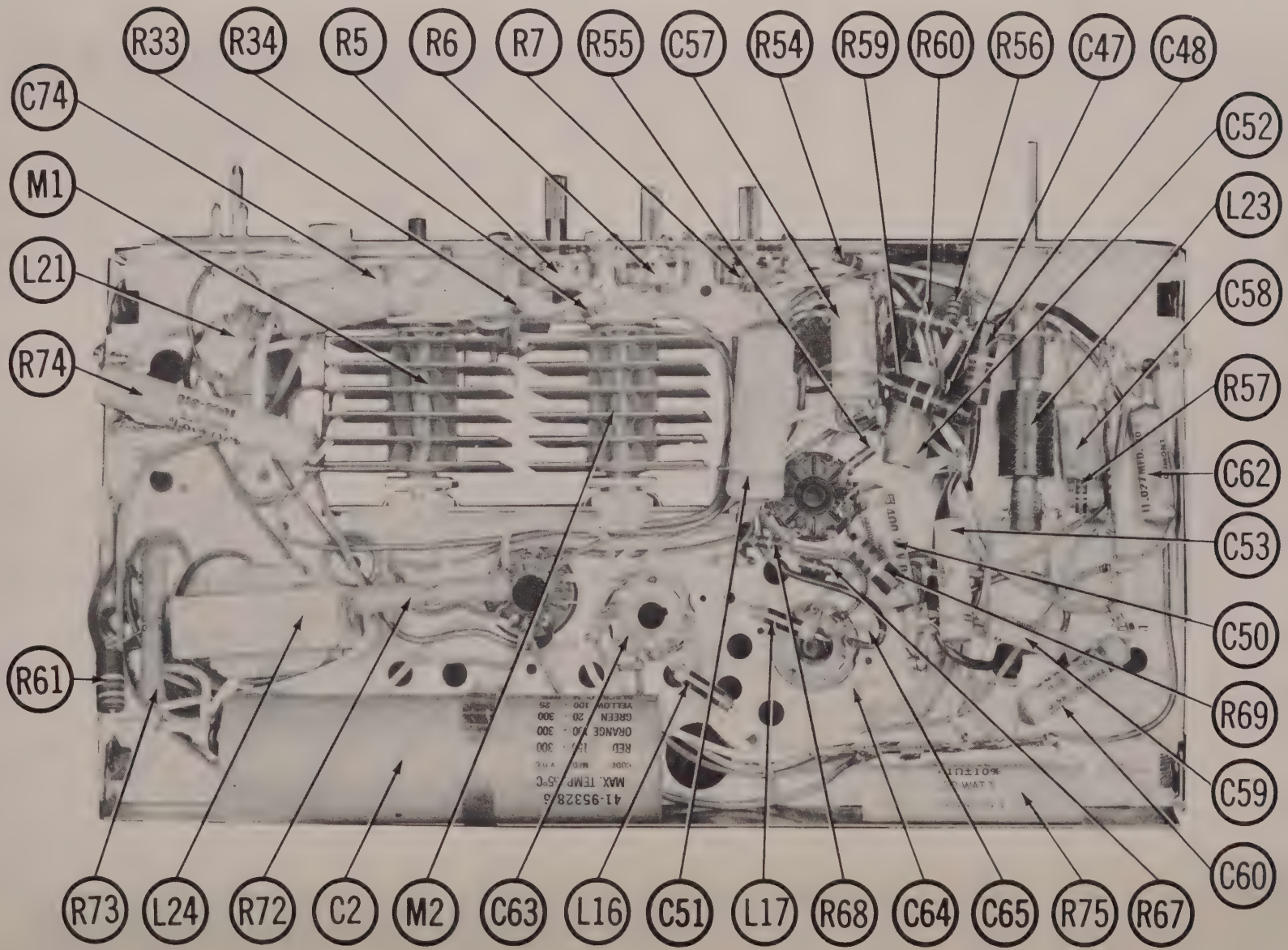
NAME	PART NO.	DESCRIPTION
Mask	716-0062	Picture Tube
Knob	740-0221	Channel Selector (lever)
Knob	733-0081	VHF Fine Tuning, UHF Fine Tuning, Picture Prompter
Knob	740-0212	Volume, Brightness, Contrast, Off-On, Tone, HaloLight, Model 23S23
Knob	740-0216	Volume, Brightness, Contrast, Off-On, Tone, HaloLight, Model 23S24
Knob	740-0254	Vert. Hold

WIRING DATA

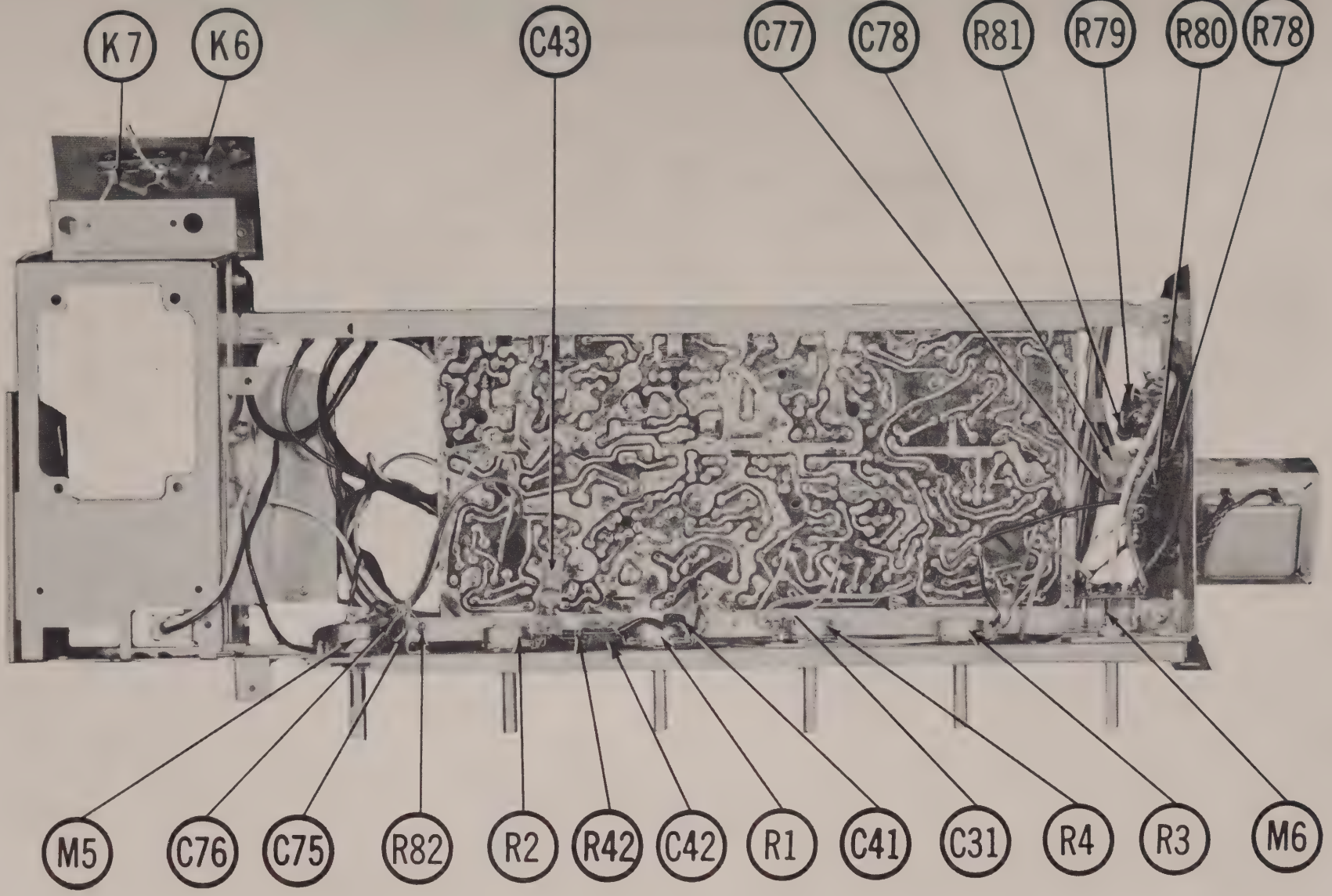
High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor



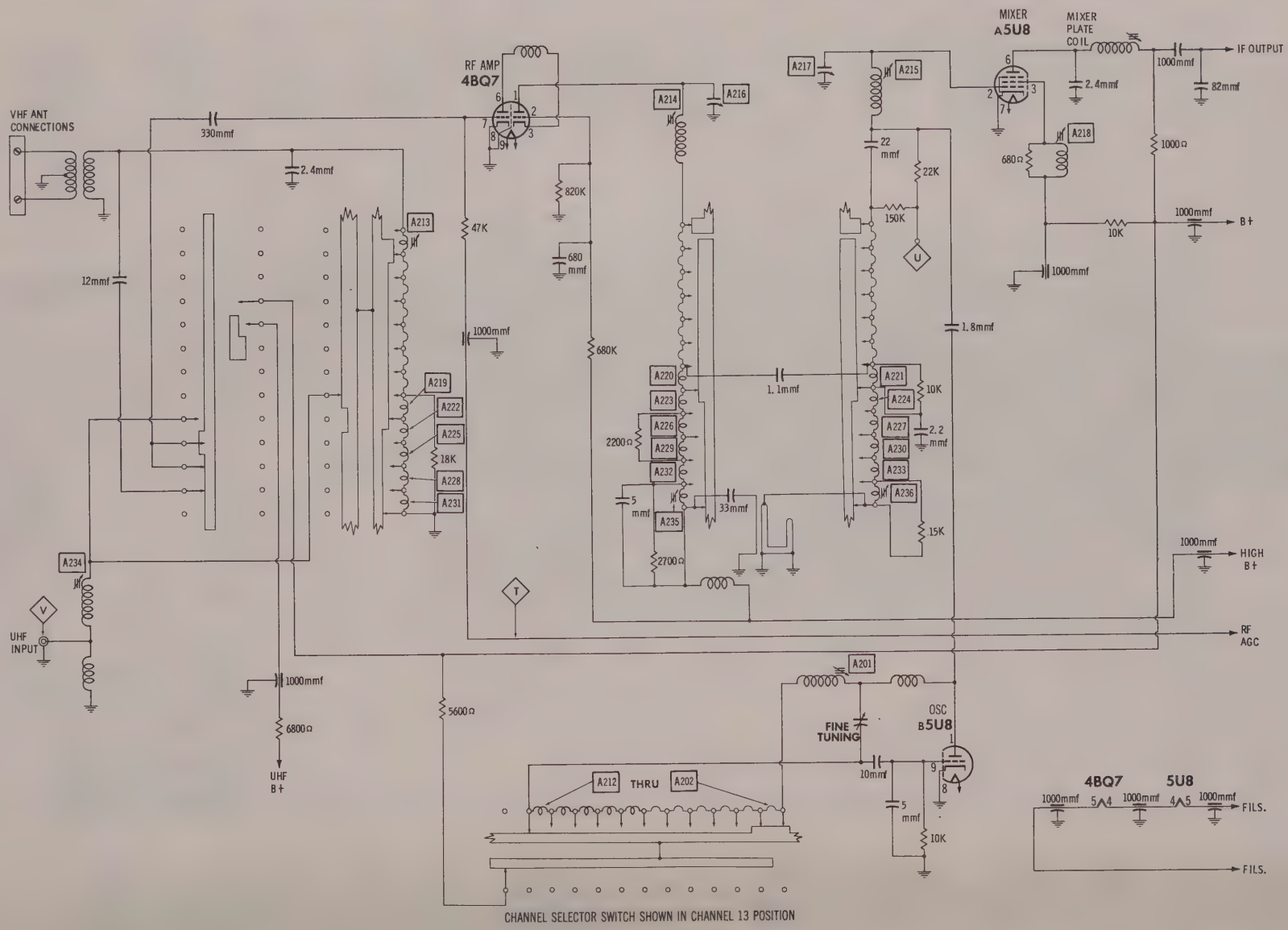
MAIN CHASSIS TOP VIEW - RESISTOR & TRANSFORMER IDENT.



POWER AND SWEEP CHASSIS - BOTTOM VIEW



MAIN CHASSIS BOTTOM VIEW - CAPACITOR, RESISTOR & MISC IDENT.



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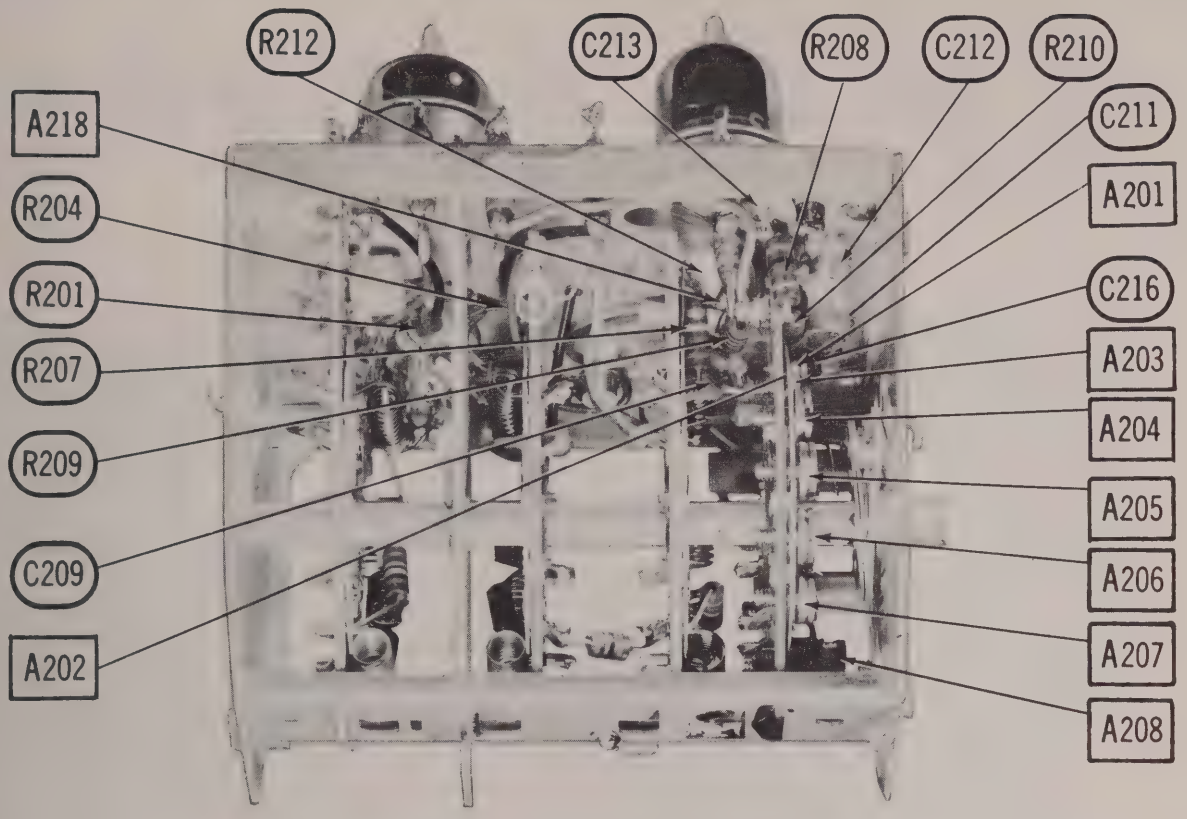
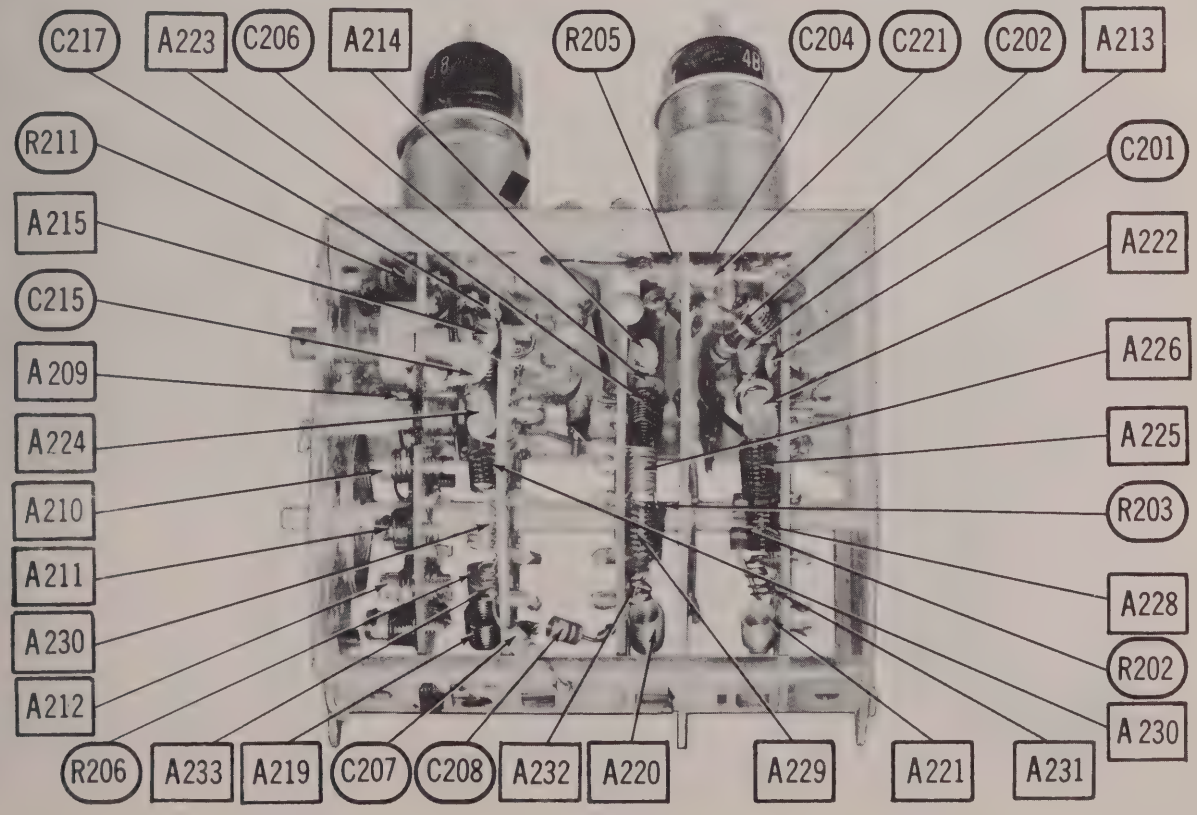
VHF TUNER with UHF Provisions 323-0098 (54-88847-2)



TUNER 323-0097 (54-88847-1) - LEFT SIDE



TUNER 323-0097 (54-88847-1) - RIGHT SIDE

TUNER PARTS LIST AND DESCRIPTIONS

323-0097(54-88847-1)

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V201	RF Amplifier	4BQ7A	V202	Mixer-Osc.	5U8

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201	2.7	NPO .25mmf						10TCC-V27
C202	12	N750 5%		TCN-12	C10Q12U		CN7-412	10TCU-Q12
C203	1000		EF-001	MFT-1000		CCF-102	CT280A	
C204	680		DI-680	DD-681	L10T68	CCF-681	GP368	10TS-T68
C205						*		
C206	33	N2200 5%						
C207	1.1	10%	NPO-SI 1.0	TCZ-1			CNO- 510	
C208	2.2	10%	NPO-SI 2.2	TCZ-2R2	C10V22C	CCTO-2R2	CNO-522	10TCC-V10
C209	22	5%	NPO-DI 22	DTZ-22	C10Q22C		CNO-422	10TCC-Q22
C210								
C211	2.4	.1mmf						
C212	1000		DI-1000	MFT-1000		CCD-102	GP210	10TS-D10
C213	82	5%		DTZ-82	C10Q82C	CCTO-820	CNO-482	10TCC-Q82
C214	1000		EF-001	MFT-1000		CCF-102	CT280A	
C215	10	N330 5%		TCA-10		*		10TCS-Q10
C216	5	N2200				*		
C217	1.8	N750						
C218	1000		EF-001	MFT-1000		CCF-102	CT280A	
C219	1000		EF-001	MFT-1000		CCF-102	CT280A	
C220	1000		EF-001	MFT-1000		CCF-102	CT280A	
C221	1000		EF-001	MFT-1000		CCF-102	CT280A	
C222	1000		EF-001	MFT-1000		CCF-102	CT280A	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

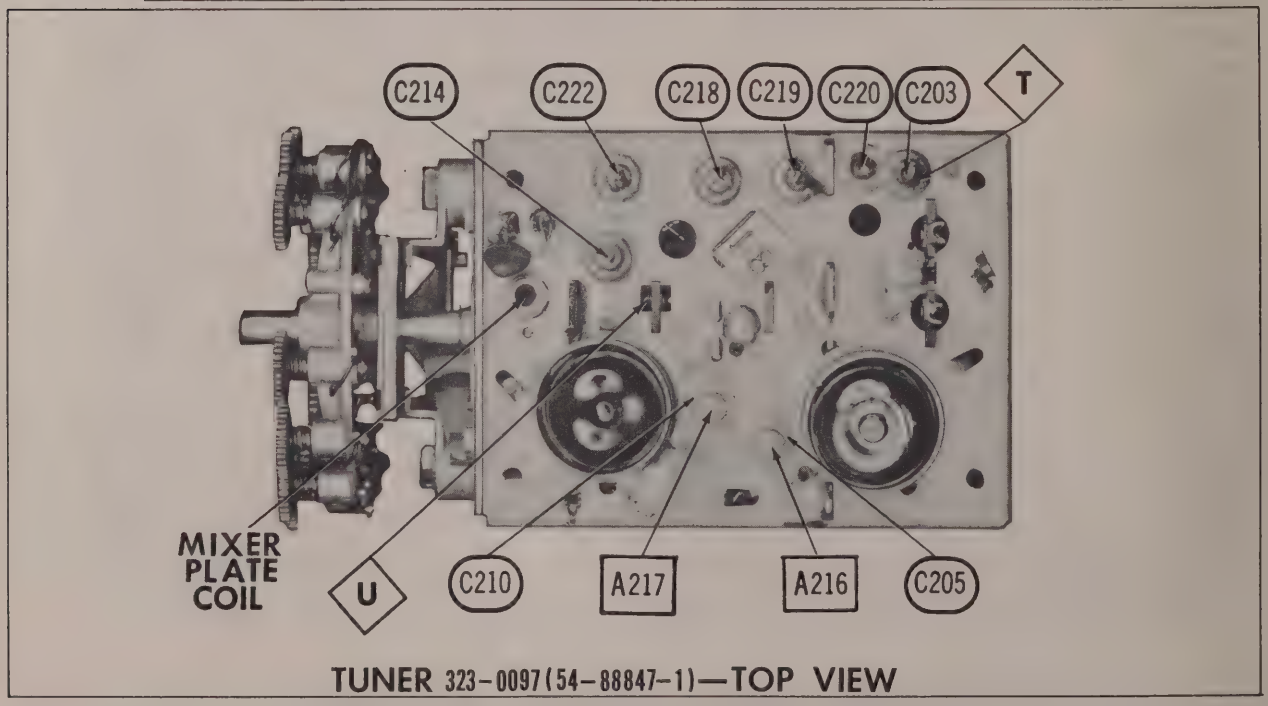
ITEM No.	RATING	REMARKS
R201	47K	
R202	18K	
R203	2200Ω	
R204	680K	

ITEM No.	RATING	REMARKS
R205	820K	
R206	12K	
R207	150K	
R208	1000Ω	

ITEM No.	RATING	REMARKS
R209	680Ω	
R210	4700Ω	
R211	10K	

MISCELLANEOUS

ITEM No.	PART NAME	SYLVANIA PART No.	NOTES
	Fine Tuning Shaft	493-0140	Assembly
	Shaft Extension	493-0138	VHF
	Lever	338-0018	Fine Tuning



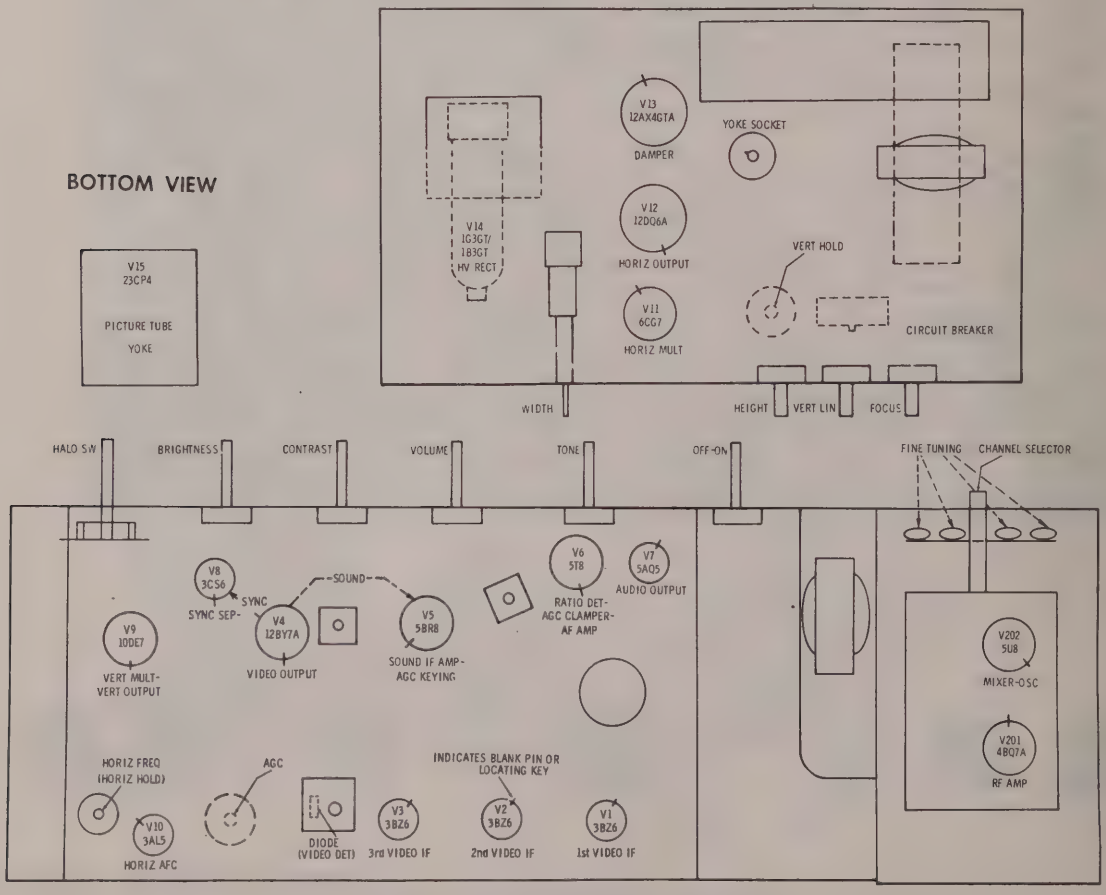
TUNER 323-0097(54-88847-1)—TOP VIEW

RESISTANCE MEASUREMENTS

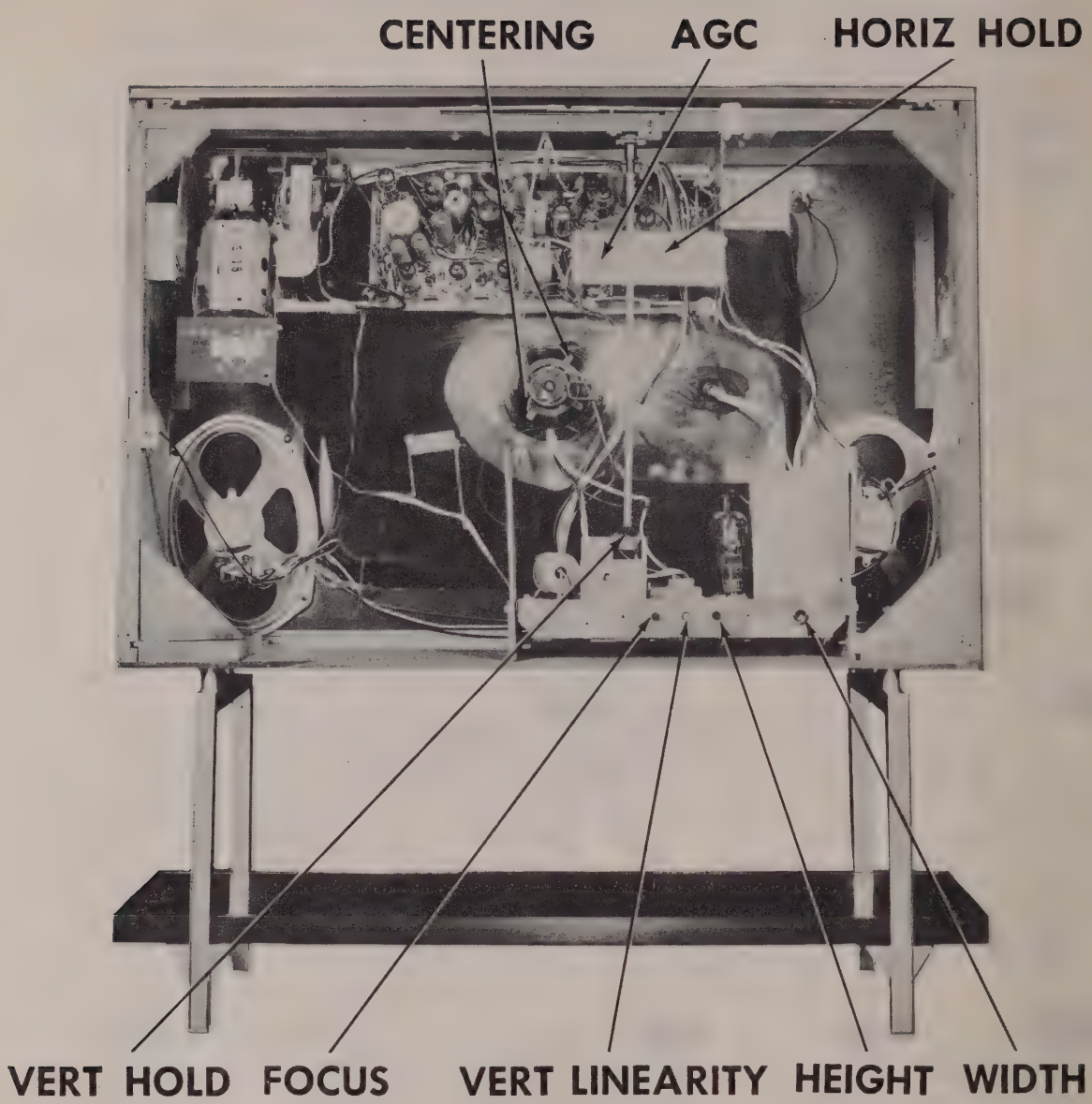
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	3BZ6	320K	68Ω	11Ω	10.5Ω	▲100Ω	▲100Ω	0Ω		
V2	3BZ6	25K	▲39Ω	10.5Ω	10Ω	†.3Ω	†.2Ω	INF		
V3	3BZ6	.1Ω	180Ω	10Ω	9.5Ω	†4900Ω	†4900Ω	0Ω		
V4	12BY7A	27Ω	3300Ω	0Ω	5.5Ω	5.5Ω	4Ω	†6500Ω	†2200Ω	0Ω
V5	5BR8	50K	320K	●†45K	4Ω	2.5Ω	†56K	†56K	150Ω	10K
V6	5T8	INF	27K	INF	0Ω	1.5Ω	790K	0Ω	10meg	†470K
V7	5AQ5	470K	270Ω	2.5Ω	1.5Ω	†1100Ω	†680Ω	470K		
V8	3CS6	†1meg	0Ω	7.5Ω	7Ω	†50K	†5000Ω	1.3meg		
V9	10DE7	†200Ω	●1.5meg	●1.5meg	16Ω	13.5Ω	●†2.3meg	●1.4meg	0Ω	270Ω
V10	3AL5	1meg	1.8meg	9Ω	9.5Ω	1meg	NC	2700Ω		
V11	6CG7	†11K	2.8meg	1000Ω	7.5Ω	9Ω	†48K	120K	1000Ω	0Ω
V12	12DQ6A	NC	22Ω	TP	†8200Ω	1meg	TP	19Ω	0Ω	TOP CAP †12Ω
V13	12AX4GTA	NC	NC	¶1meg	NC	†40Ω	TP	19Ω	16Ω	
V14	1G3GT/ 1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP †262Ω
V15	23CP4	7Ω	47K	†0Ω	●1.8meg	NC	NC	●280K	5.5Ω	
V201	4BQ7A	†750Ω	420K	INF	12.5Ω	13.5Ω	INF	800K	0Ω	0Ω
V202	5U8	†6900Ω	170K	†2900Ω	12.5Ω	11Ω	†3200Ω	0Ω	0Ω	10K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
● THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
▲ MEASURED FROM PIN 7 OF V2.
† MEASURED FROM 240V SOURCE.
ǂ MEASURED FROM PIN 3 OF V13.

NC NO CONNECTION.
TP TIE POINT.



TUBE PLACEMENT CHART



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern.

Turn the Horizontal Hold clockwise until the picture loses sync. It may be necessary to switch off channel and back again for picture to lose sync.

Turn the Horizontal Hold slowly counterclockwise until the picture just falls into sync.

Adjust Width (B1) for a picture SLIGHTLY wider than necessary to fill the picture mask.

PHOTOFACT® Folder

TRUETONE MODELS 2DC1030A, 1032A, 1034A, 1036A, 1038A, 2030A

TRUETONE MODELS 2DC1030A, 1032A, 1034A, 1036A, 1038A, 2030A

MODEL 2DC2030A

TRUETONE MODELS 2DC1030A, 1032A, 1034A, 1036A, 1038A, 2030A

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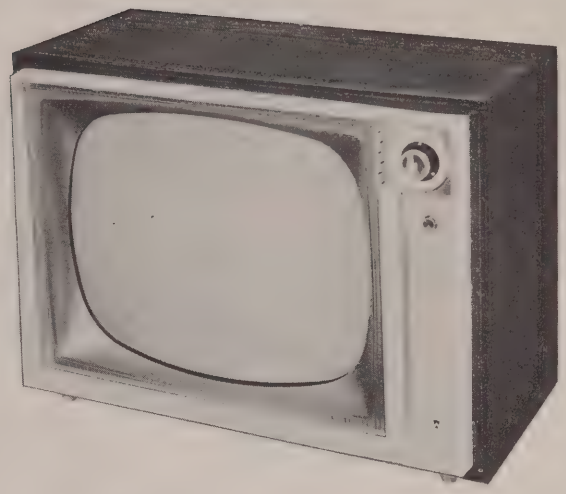
PHOTOFACT® Folder

TRUETONE MODELS 2DC1030A, 1032A, 1034A, 1036A, 1038A, 2030A

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 11 wood screws holding rear cover. Remove the rear cover.
2. Remove push-on type channel selector knob. Remove the channel selector escutcheon by pulling straight out. Remove remaining 6 push-on type knobs from the front.
3. Remove speaker leads and antenna leads.
4. Remove 1 wood screw holding tuner mounting bracket at top left rear of cabinet. Remove 4 wood screws holding picture tube mounting bracket at top of picture tube.
5. Remove 4 chassis bolts from bottom of cabinet.
6. Remove chassis.



MODEL 2DC2030A

CAUTION

ONE SIDE OF AC LINE CONNECTED TO CHASSIS.

Care should be exercised when connecting test equipment or physically contacting chassis. Isolation devices employed by manufacturer should be checked and properly connected before returning receiver to owner.

TRADE NAME	Truetone MODELS 2DC1030A, 2DC1032A, 2DC1034A, 2DC1036A, 2DC1038A, 2DC2030A
SUPPLIER	Western Auto Supply Co., 2107 Grande Avenue, Kansas City 8, Mo.
TYPE SET	Television Receiver
TUBES	VHF-Fourteen, UHF-Fifteen
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING 150 Watts, 1.45 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC

SERVICING IN THE FIELD

SAFETY GLASS REMOVAL

Remove 2 screws holding the trim strip at the top edge of the safety glass. Tilt glass out and remove.

FUSE DEVICE

A 7.5Ω fusible resistor is used for low voltage power supply protection. (For location, see "Chassis Top View".)

TUNER OSCILLATOR ADJUSTMENTS

To touch-up the VHF Oscillator, it is necessary to remove the rear cover. The adjustments are accessible thru a hole in the right side of the tuner rear cover as viewed from the rear of the tuner.

AGC

The AGC may be varied by means of a Range control. (For location, see "Tube Placement Chart".)

FOCUS

No provision is made to vary the focus on this receiver.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

The Horizontal Frequency slug is used for the Horizontal Hold. (For location, see "Tube Placement Chart".)

HORIZONTAL DRIVE

The horizontal drive may be varied by a Horizontal Drive trimmer. (For location, see "Tube Placement Chart".)

CENTERING

Centering is accomplished by 2 magnetic rings, located behind the yoke, on the neck of the picture tube.

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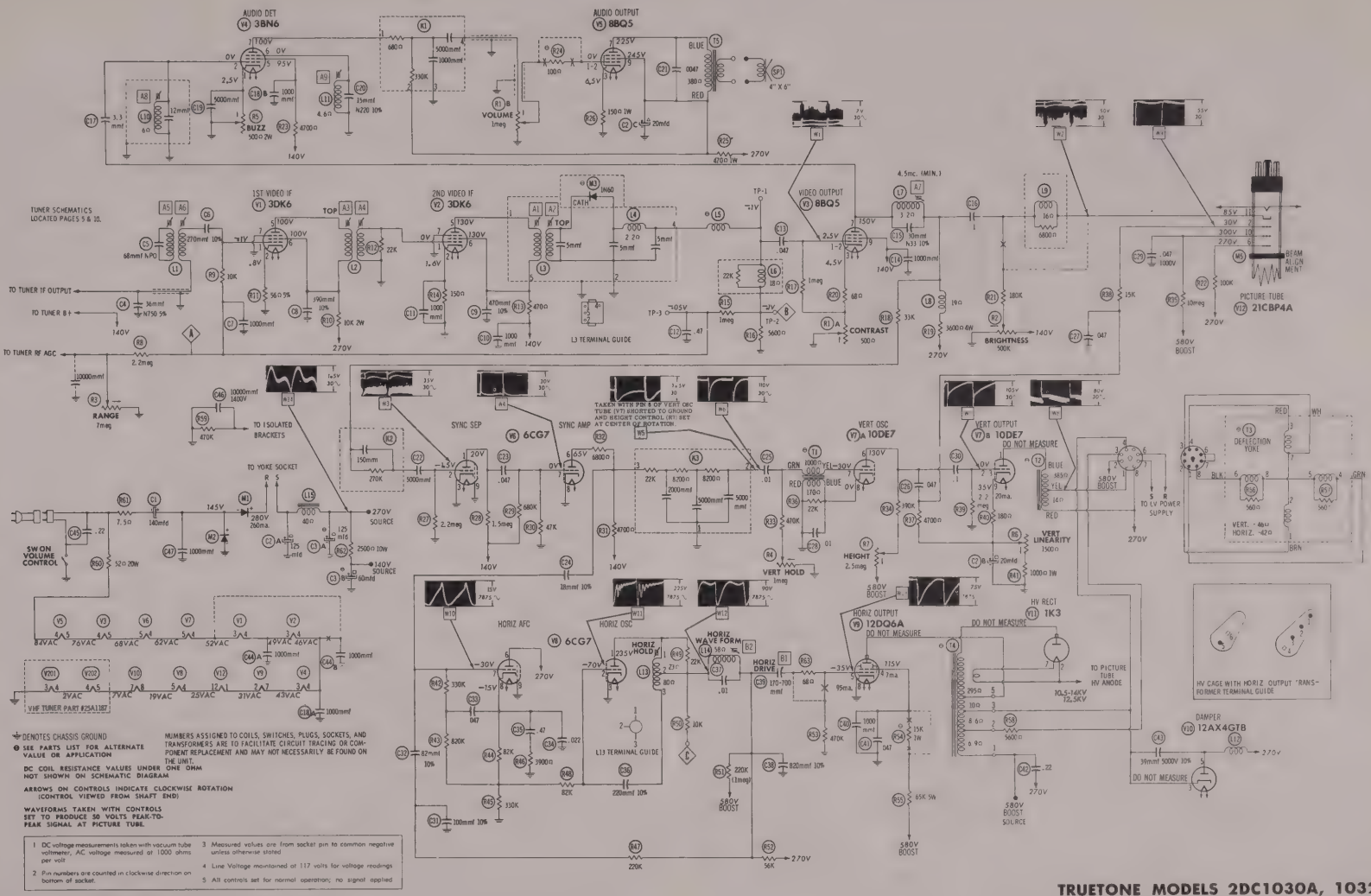
JA707

SET 472 FOLDER 2


AUDIO DET
V4 3BN6
AUDIO OUTPUT
V5 8BQ5
1ST VIDEO IF
V1 3DK6
2ND VIDEO IF
V2 3DK6
VIDEO OUTPUT
V3 8BQ5
SYNC SEP
V6 6CG7
SYNC AMP
V6 6CG7
VERT OSC
V7A 10DE7
VERT OUTPUT
V7B 10DE7
HORIZ AFC
V6 6CG7
HORIZ OSC
HORIZ OUTPUT
V9 12DQ6A
HV RECT
V11 1K3
DAMPER
V10 12AX4GTB
PICTURE TUBE
V12 21CBP4A
TUNER SCHEMATICS LOCATED PAGES 5 & 10.
TO TUNER IF OUTPUT
TO TUNER B+
TO TUNER RF AGC
TO ISOLATED BRACKETS
TO YOKE SOCKET
SW ON VOLUME CONTROL
VOLUME
CONTRAST
BRIGHTNESS
HEIGHT
VERT HOLD
VERT LINEARITY
HORIZ HOLD
HORIZ WAVE FORM
HORIZ DRIVE
RANGE
BUZZ
BEAM ALIGNMENT
DEFLECTION YOKE
L13 TERMINAL GUIDE
TAKEN WITH PIN 8 OF VERT OSC TUBE (V7) SHORTED TO GROUND AND HEIGHT CONTROL (R7) SET AT CENTER OF ROTATION.
DO NOT MEASURE
TO PICTURE TUBE HV ANODE
HV CAGE WITH HORIZ. OUTPUT TRANSFORMER TERMINAL GUIDE
VHF TUNER PART #25A1187
DENOTES CHASSIS GROUND
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
1 DC voltage measurements taken with vacuum tube voltmeter, AC voltage measured at 1000 ohms per volt
2 Pin numbers are counted in clockwise direction on bottom of socket.
3 Measured values are from socket pin to common negative unless otherwise stated
4 Line Voltage maintained at 117 volts for voltage readings
5 All controls set for normal operation; no signal applied

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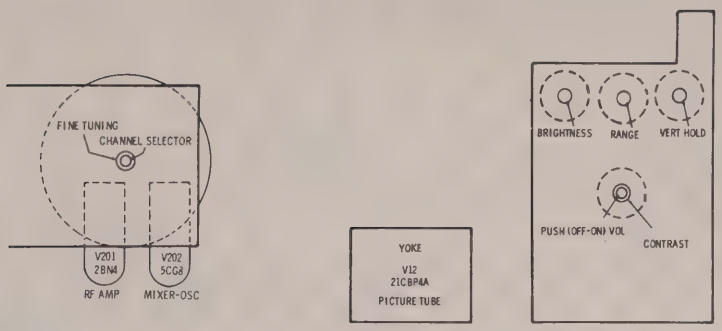
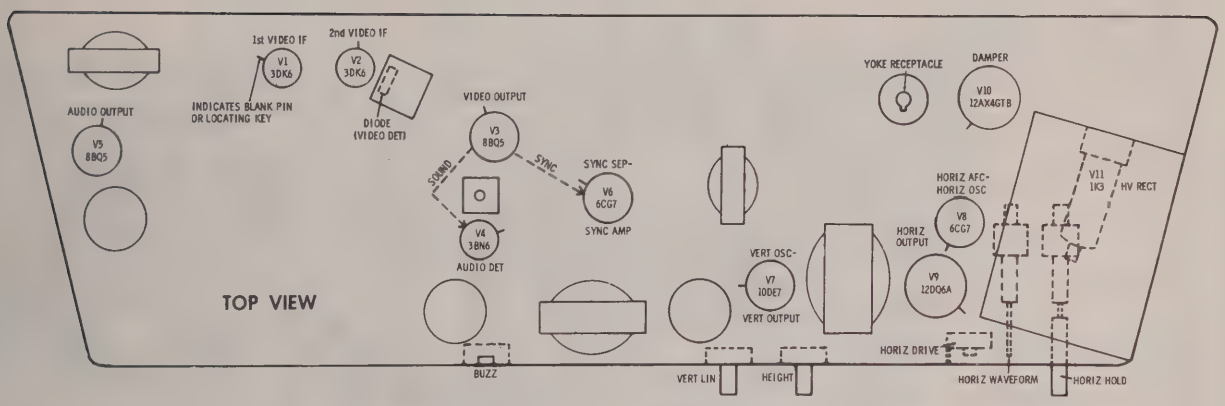
TRUETONE MODELS 2DC1030A, 1032A, 1034A, 1036A, 1038A, 2030A

TUBE PLACEMENT CHART





TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce indicated symptoms. Refer to tube placement chart for location and type of tube.

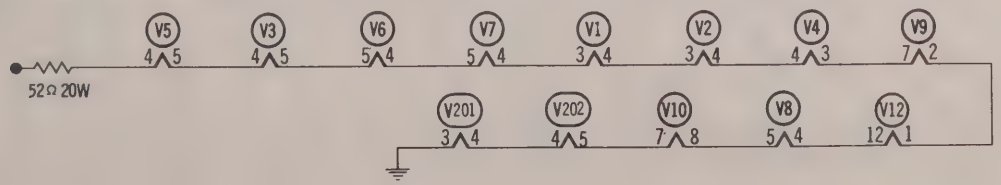
POWER SUPPLY FAILURE
No raster, no sound Fusible Resistor (LV Power), Rect. (LV Power)

SWEEP FAILURE
No raster, has sound V8, V9, V10, V11, V12
No vertical deflection V7
Poor vert. linearity or foldover V7
Poor horiz. linearity or foldover V8, V9, V10
Narrow picture Rect. (LV Power), V8, V9, V10
Vert. off freq. V7
Horiz. off freq. V8

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster V1, V2, Diode (Video Det), V3
No pic, no sound, has snow V201, V202
No pic, has sound, has raster V3, V12
Has pic, no sound V4, V5

SYNC FAILURE
No vert. sync V7
No horiz. sync V8
No vert. or horiz. sync V6

This receiver employs tubes used in a series filament network, an open filament in any tube will cause the set to be inoperative. (See circuit below.)

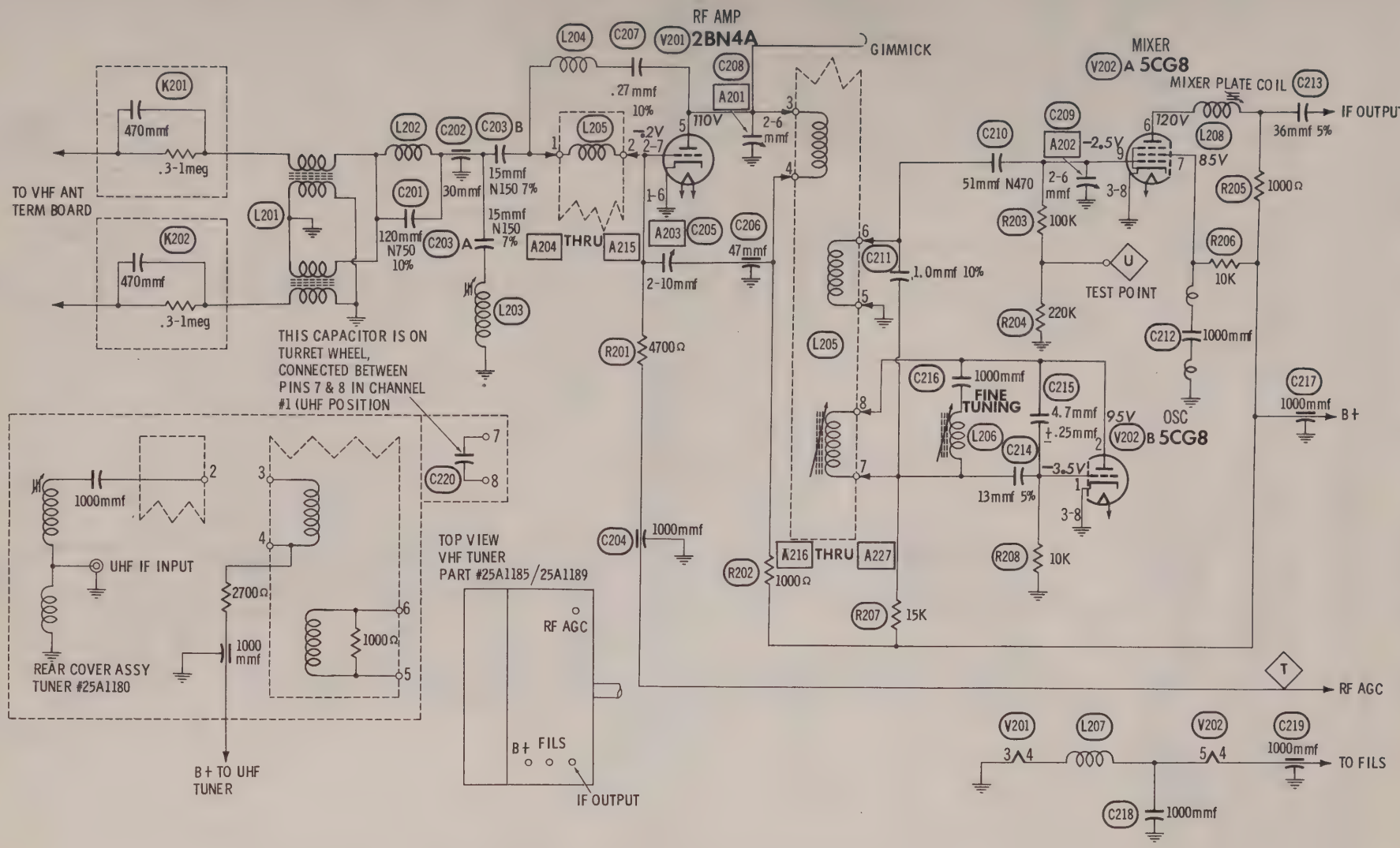


TRUETONE MODELS 2DC1030A, 1032A, 1034A, 1036A, 1038A, 2030A

FOLDER 2

TRUETONE MODELS 2DC1030A, 1032A, 1034A, 1036A, 1038A, 2030A

CHASSIS - BOTTOM VIEW



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VHF TUNER 25A1185 OR 25A1189

TRUETONE MODELS 2DC1030A, 1032A, 1034A, 1036A, 1038A, 2030A

TUNER ALIGNMENT INSTRUCTIONS

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
The High Voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.

VHF RF AND MIXER ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Connect the negative lead of a 2.5 volt bias supply to point Ⓣ. Positive to chassis.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	195MC	193.25MC 197.75MC	10	Vert. Amp. thru 10K to point Ⓤ. Low side to chassis.	A201 A202 A203	Adjust A201 and A202 for maximum amplitude and symmetry with markers as shown in Fig. 201. Increase bias for MINIMUM amplitude of response curve. Without changing the bias adjust A203 to obtain MINIMUM response on the scope.
2.	"	"	213MC	211.25MC 215.75MC	13	"	A204	Adjust for maximum amplitude of response similar to Fig. 201. Adjust by expanding or compressing coil turns.
			207MC	205.25MC 209.75MC	12		A205	
			201MC	199.25MC 203.75MC	11		A206	
			195MC	193.25MC 197.75MC	10		A207	
			189MC	187.25MC 191.75MC	9		A208	
			183MC	181.25MC 185.75MC	8		A209	
			177MC	175.25MC 179.75MC	7		A210	
			85MC	83.25MC 87.75MC	6		A211	
			79MC	77.25MC 81.75MC	5		A212	
			69MC	67.25MC 71.75MC	4		A213	
			63MC	61.25MC 65.75MC	3		A214	
			57MC	55.25MC 59.75MC	2		A215	

VHF OSCILLATOR ALIGNMENT

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Connect variable bias to IF AGC line. Adjust bias to obtain response curve which shows no indication of overloading.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 47KΩ across Video Det. load.	A216	Adjust to place sound marker in trap notch as in Fig. 202. Video marker should fall at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A217	
			201MC	199.25MC 203.75MC	11		A218	
			195MC	193.25MC 197.75MC	10		A219	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A220	
			183MC	181.25MC 185.75MC	8		A221	
			177MC	175.25MC 179.75MC	7		A222	
			85MC	83.25MC 87.75MC	6		A223	
			79MC	77.25MC 81.75MC	5		A224	
			69MC	67.25MC 71.75MC	4		A225	
			63MC	61.25MC 65.75MC	3		A226	
			57MC	55.25MC 59.75MC	2		A227	

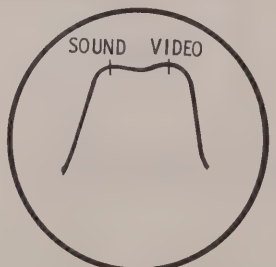


FIG. 201

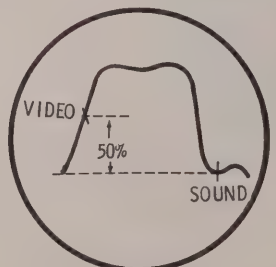


FIG. 202

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Use an ISOLATION TRANSFORMER TO PROTECT the Test Equipment.
The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.
Suggested Alignment Tools: GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545

VIDEO IF ALIGNMENT

Connect the negative lead of a 7 volt bias supply to point (A) . Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.01mfd	High side to pin 1 (grid) of 2nd Video IF. Low side to chassis. Adjust output for 4VP-P on scope.	44.0MC (10MC Swp)	42.4MC 45.75MC	Any non-interfering channel	Vert. Amp. thru 47K to point (B) . Low side to chassis. (Across Video Det. load)	A1, A2	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. A1 controls marker position and A2 controls gain and symmetry.
2.	"	High side to pin 1 (grid) of 1st Video IF. Low side to chassis. Adjust for 4VP-P on scope.	"	42.4MC 43.5MC 44.5MC 45.75MC	"	"	A3, A4	Adjust for maximum gain and symmetry of response similar to Fig. 2 with markers as shown. A3 controls marker position and A4 controls gain and symmetry.
3.	Direct	Place a thin insulated metal strip between the Mixer-Osc. tube (V202), and tube shield. Connect the high side of sweep generator to the metal strip. Low side to chassis.	"	41.25MC 42.4MC 43.5MC 44.5MC 45.75MC	"	"	A5, A6, & Mixer Plate Coil	Adjust for maximum gain and symmetry of response similar to Fig. 3 with markers as shown. Adjust A5 to place 41.25MC marker in trap notch.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
4.	.01mfd	High side to pin 2 (grid) of Video Output. Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	AC probe to pin 11 (cathode) of picture tube. Common to chassis. Use 0-10V AC scale.	A7	Adjust for MINIMUM deflection.

SOUND IF ALIGNMENT

Tune in a TV station and reduce the signal strength at the antenna terminals until a hiss is heard in the sound similar to super-regeneration.
Adjust A8, A9 and the Buzz control (R8) for maximum undistorted sound with MINIMUM buzz.
If the hiss disappears during adjusting, further reduce the signal strength.

FIG.1

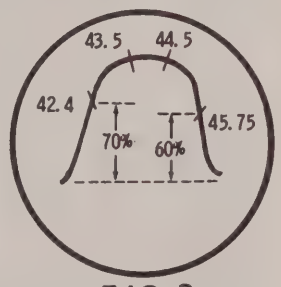


FIG.2

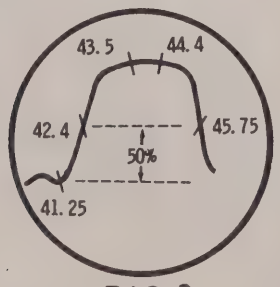


FIG.3

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No	USE	TYPE	ITEM No	USE	TYPE
V1	1st Video IF Amp	3DK6	V7	Vert Osc - Vert Output	10DE7
V2	2nd Video IF Amp.	3DK6	V8	Horiz AFC-Horiz Osc	6CG7
V3	Video Output	8BQ5	V9	Horiz Output	12DQ6A
V4	Audio Det	3BN6	V10	Damper	12AX4GTB
V5	Audio Output	8BQ5	V11	HV Rect	1K3
V6	Sync Sep -Sync Amp	6CG7			

PICTURE TUBE

ITEM No	REPLACEMENT DATA					NOTES
	TRUETONE PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
V12	21CBP4-A	21CBP4A ⌶	21CBP4-A ①	21CBP4/ 21CBP4A	21CBP4/ 21CBP4A ②	① Aluminized ② "Silver Screen 85"

ELECTROLYTIC CAPACITORS

ITEM No.	RATING			REPLACEMENT DATA						NOTES
	CAP	VOLT		TRUETONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1	140	150		45X431	AFHR-25	XA0251	FP117	TM5-24	TVL-1438	
C2A	+125	300		45X431	AFHR1-02-E	XC0733.2	FP323.15	TMT-26	TVL8-3574.3 *	
B	+20	300								
C	+20	50								
C3A	+125	300		45X467	AFH3-99-R2	D0046	FP326.75	TMT-26	TVL-3574.6	Note 1
B	+80	300								

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.
Note 1 Early versions may use 3 section (125mfd @ 300V, 60mfd @ 300V, 40mfd @ 50V) in this application.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No	RATING		REMARKS	REPLACEMENT DATA						
				AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.	
C4	36 N750 5%				TCN-36	C10Q36U		GEM-6041	4TM-P1	
C5	68 NPO			NPO-DI 68	DTZ-68	C10Q68C	CCTO-680	CNO-468	10TCC-Q68	
C6	270 10%			DI-270	DD-271	L10T27	CCD-271	GP-327	10TS-T27	
C7	1000			DI-1000	DD-102	BYA10D1	CCD-102	B-210	5HK-D10	
C8	390 10%			DI-390	DD-391	L10T39	CCD-391	GP-339	10TS-T39	
C9	470 10%			DI-470	DD-471	5R5T47	CCD-471	GP-347	10TS-T47	
C10	1000			BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10	
C11	1000			BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10	
C12	. 47 200V			P288N-47		CUB2P47	2DP-5-474	GEM-2047	2TM-P47	
C13	. 047 200V			P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47	
C14	1000			BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10	
C15	30 N33 10%		#47X668							
C16	. 1 600V			P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-6041	4TM-P1	
C17	3.3			NPO-SL 3.3	TCZ-3R3	C10Y33C	CCTO-3R3	CNO-533	10TCC-Y33	
C18A	1000			BPD-2X001	DD2-103	BYC6DD1	CCD-103	B3X210	5HK-2D10	
B	1000						CCD-103			
C19	5000			BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50	
C20	15 N220 10%		#47X672						10TCR-Q15	
C21	. 0047 600V			P688N-0047	DS-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47	
C22	5000			BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50	
C23	. 047 400V			P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47	
C24	18 10%			1469-000018	TCZ-18	22R5Q18	CM-20B-180K	CNO-418	MS-418	
C25	. 01 400V			P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S1	
C26	. 047 600V			P688N-047	DD-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47	
C27	. 047 200V			P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47	
C28	. 01 400V			P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S1	
C29	. 047 1000V			P1068N-047		CUB10S47	10DP-5-473	GEM-10147	10TM-S47	
C30	. 1 600V			P688N-1	DF-104	CUB6P1	6DP-4-104	GEM-601	6TM-P1	
C31	100 10%			1469-0001	D6-101	22R5T1	CM-20B-101K	MCB235	MS-31	
C32	82 10%			1469-000082	D6-820	22R5Q82	CM-20B-820K	CNO-482	MS-482	
C33	. 047 200V			P288N-047	DD-503	CUB2S47	4DP-3-473	GEM-4147	2TM-S47	
C34	. 022 200V			P288N-022		CUB4S22	4DP-2-223	GEM-4122	2TM-S22	
C35	. 47 200V			P288N-47		CUB2P47	2DP-5-474	GEM-2047	2TM-P47	
C36	220 10%			1469-00022	D6-221	22R5T22	CM-20B-221K	MCB237	MS-322	
C37	. 01 400V			P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S1	
C38	820 10%			1469-00082	D6-821	1R5T82	CM-30B-821K 469	MCB251	MS-383	
C39	170-700		#17A276							
C40	1000			BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10	
C41	. 047 400V			P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47	
C42	. 22 400V			P488N-22		CUB4P22	4DP-5-224	GEM-4022	4TM-P22	
C43	39 5000V 10%		#47X756				HVDM-42-390J	5DP-439	5DT-439	
C44A	1000			BPD-2X001	DD2-102	BYC6DD1	CCD-102	B3X210	5HK-2D10	
B	1000						CCD-102			
C45	. 22 400V			P488N-22		CUB4P22	4DP-5-224	GEM-4022	4TM-P22	
C46	10000 1400V			DAC-27	DDI8-103	HVB10B2	18DP-3-103	21EV-110	M33-S1	
C47	1000			BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10	

Part Number.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	TRUETONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500Ω	½	78X30		RTV-688			Contrast
B	1meg	½			Not Req.		• (UE4065-S	Volume
C	Switch				Not Req.			Push-Pull Off-On
R2A	500K	½	40X423	AB-59	A47-500K-S	QI1-133	U50	Brightness
B	Shaft			AK-8	R8-3/16	NQ	DS-37	
R3A	7meg	½	40X465	AB-89	A47-7.5meg-S		DN3	Range
B	Shaft			AK-8	R8-3/16		DS-37	

CONTROLS (cont)

ITEM No	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	TRUETONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R4A	1meg	½	40X425	AB-69	A47-1meg-S	QI1-137	U54	Vert Hold
B	Shaft			AK-8	RS-3/16	NQ	DS-37	
R5	500Ω	2(WW)	40X472	WN-501	39-500	113-500	R500L	Buzz
R6A	1500Ω	½	40X464	AB-6	B47-1500-S	B11-109	PTA152L	Vert Lin
B	Shaft			AK-19	Not Req.	TM4	Not Req.	
R7A	2.5meg	½	40X466	AB-83	B47-2.5meg-S	B11-239	BU566	Height
B	Shaft			AK-19	Not Req.	TM4	Not Req.	

■ "ITA-LOC" Equivalent: FA82L, RUP16L, OF1000.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R8	2.2meg	
R9	10K 2W	
R10	10K 2W	
R11	56Ω 5%	
R12	22K	
R13	470Ω	
R14	150Ω	
R15	1meg	
R16	5600Ω	
R17	1meg	
R18	33K	
R19	3600Ω 4W	#43X331
R20	58Ω	
R21	180K	
R22	100K	
R23	4700Ω	
R24	100Ω	Note 1
R25	470Ω 1W	
R26	150Ω 1W	

ITEM No.	RATING	REMARKS
R27	2.2meg	
R28	1.5meg	
R29	680K	
R30	47K	
R31	4700Ω	
R32	6800Ω	
R33	470K	
R34	390K	
R35	10meg	
R36	22K	
R37	4700Ω	
R38	15K	
R39	2.2meg	
R40	180Ω	
R41	1000Ω 1W	
R42	330K	
R43	680K	
R44	82K	
R45	330K	

ITEM No.	RATING	REMARKS
R46	3900Ω	
R47	220K	
R48	82K	
R49	22K	
R50	10K	
R51	220K	*(1meg)
R52	56K	
R53	470K	
R54	15K 1W	Note 1
R55	68K 5W	#43X342
R56	560Ω	
R57	58Ω	
R58	5600Ω	
R59	470K	
R60	52Ω 20W	#43X302
R61	7.5Ω	#43X397
R62	2500Ω 10W	
R63	68Ω	

* Alternate value. # Part Number. Note 1. Not used in some versions.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	TRUETONE PART No.	REPLACEMENT DATA	
K1	Audio Coupling	1000mmf, 5000mmf, 680Ω, 330K	76X16		
K2	Sync Coupling	150mmf, 270K	76X15		
K3	Vert. Integrator	2000mmf, 5000mmf, 5000mmf, 820Ω, 820Ω, 22K	76X7	Aerovox	PA-110
				Centralab	PC-100
				Cornell-Dubilier	115TM1
				Sprague	V-1/ V-3
				Mallory	MS-100

COILS (RF-IF)

ITEM No	USE	REPLACEMENT DATA							NOTES
		TRUETONE PART No	Gramer PART No	Meissner PART No	Merit PART No.	Miller PART No.	Ram PART No		
L1A	1st Video IF	9A2436				6221 ▲			
B	4), 25MC Trap								
L2	2nd Video IF	9A2444							
L3	3rd Video IF	9A2435						90uh	
L4	Series Peaking Coil	†						8.9uh ①	
L5	Resonant Choke							290uh ②	
L6	Shunt Peaking Coil	36A22	19-3300▲	19-3300▲	TV-199▲	6155▲			
L7	4.5MC Trap	9A2366	20-1004	20-1004	TV-151	1669 *	SF-3		
L8	Shunt Peaking Coil	36A27	19-3330	19-3330	TV-200	6132	VP-7	325uh	
L9	Series Peaking Coil	36A45	19-3275▲	19-3275▲	TV-196▲	6130▲	VP-8▲	270uh ③	
L10	1st Sound IF	9A2434	17-1026	17-1026					
L11	Quadrature Coil	9A2367	20-1006	20-1005	TV-121	1680			
L12	RF Choke	9A2380	19-1001	19-1001	BC-562	4604		1.5uh	

① Some versions may use 30uh choke Part #9A2375.
② Wound on 22K resistor.
③ Wound on 6800Ω resistor.
† Part of L8.
▲ Disregard secondary winding.
▲ Parallel with 33K resistor.
* Disregard tap.
* Parallel with 6800Ω resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA						NOTES
	PRI.	SEC.	TRUETONE PART No.	Halldorson PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Thordarson PART No.	
L13	105Ω		9A2371	HS-7	TV-165	6312		HS-7	Horiz. Osc. Tapped@80Ω
L14	58Ω		9A2372	HS-5 ▲		6315		HS-5 ▲	Horiz. Waveform

▲ Enlarge mounting hole.

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA							
	CURRENT (Measured)	DC RES	INDUCTANCE (0 CURRENT 1000 ~)	TRUETONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
L15	.220A	40Ω	1 By.	53X95-11	26C44				26C44	C-34X	

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA								
		TRUETONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Rogers PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	Vert Osc	54X19-A	26A03	A-3003	V405	VB019	A-8125	26A03	A-97X	
	Alt. Vert Osc	54X19	26A03	A-3003	V405	VB019	A-8125	26A03	A-97X	
T2	Vert Output	51X207-1A	28373 ⌊	A-2855	V307-1⌋2	VO26 ⌊	VO-108	28373 ⌊	A-118X ⌊1⌋	
	Alt Vert Output	51X207	28373 ⌊	A-2855	V307-1⌋2	VO26 ⌊	VO-108	28373 ⌊	A-118X ⌊1⌋	
T3	Yoke-Horiz (24MH)	C9A2452 ⌊	Y-16	MDF-92	Y90F19/43		DY-16A	Y-16	Y-45 ⌊	
	(90°)-Vert. (28MH)		⌊5⌋6	⌊5⌋7	⌊5⌋8		⌊5⌋3	⌊5⌋8	NW-21 ⌊	
	Alt. Yoke	9A3468 ④	Y-16	MDF-92	Y90F19/43		DT-16A	Y-16	Y-46 ▲	
			⌊3⌋1	⌊3⌋2	⌊3⌋3		⌊3⌋7	⌊3⌋8	NW-22 ⌊	
	Rear Cover & Centering Device	2A435							YC-1	
	Yoke Retainer	8X247 ⌊							CL-1	
	Yoke Clamp	30X611 ⌋								
T4	Horiz. Output	53X386A								
	Alt. Horiz. Output	53X381								

① Drill new mounting hole(s)
② Connect as autoformer
③ Do not use screen tap.
④ Includes R56 and R57.
⑤ Use original rear cover and centering device.
⑥ Connect same as original
⑦ Remove horizontal damping network from yoke.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI	SEC.	TRUETONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T5	6000Ω	3-4Ω	51X206	24849	A-3026	AU-601	A-3877	24849	S-6X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	TRUETONE PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	12A541-2	4A1	Table Model
	5"	PM		12A527		Console and Low Boy Models

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT (Measured)	TRUETONE PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.		
M1	.260A	66X23 ⌊	SD500 ⌊	HA504 ①	40K ⌊	SR500 ⌊	① Silicon Type	
M2	.260A	66X23 ①	SD500 ①	HA504 ①	40K ①	SR500 ⌊		

CRYSTAL DIODES

ITEM No.	ORIG TYPE	REPLACEMENT DATA				NOTES
		TRUETONE PART No.	CBS PART No	RAYTHEON PART No	SYLVANIA PART No	
M3	1N60 (CK706)*		1N60	1N60	1N60	Video Det (Pigtail) * Alternate

MISCELLANEOUS

ITEM No.	PART NAME	TRUETONE PART No.	NOTES
M4	Tuner	25A1185	VHF
	Tuner	25A1189	VHF
	Tuner	25A1158-3	UHF
	Magnet	2A478	Beam Alignment used with some picture tubes

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

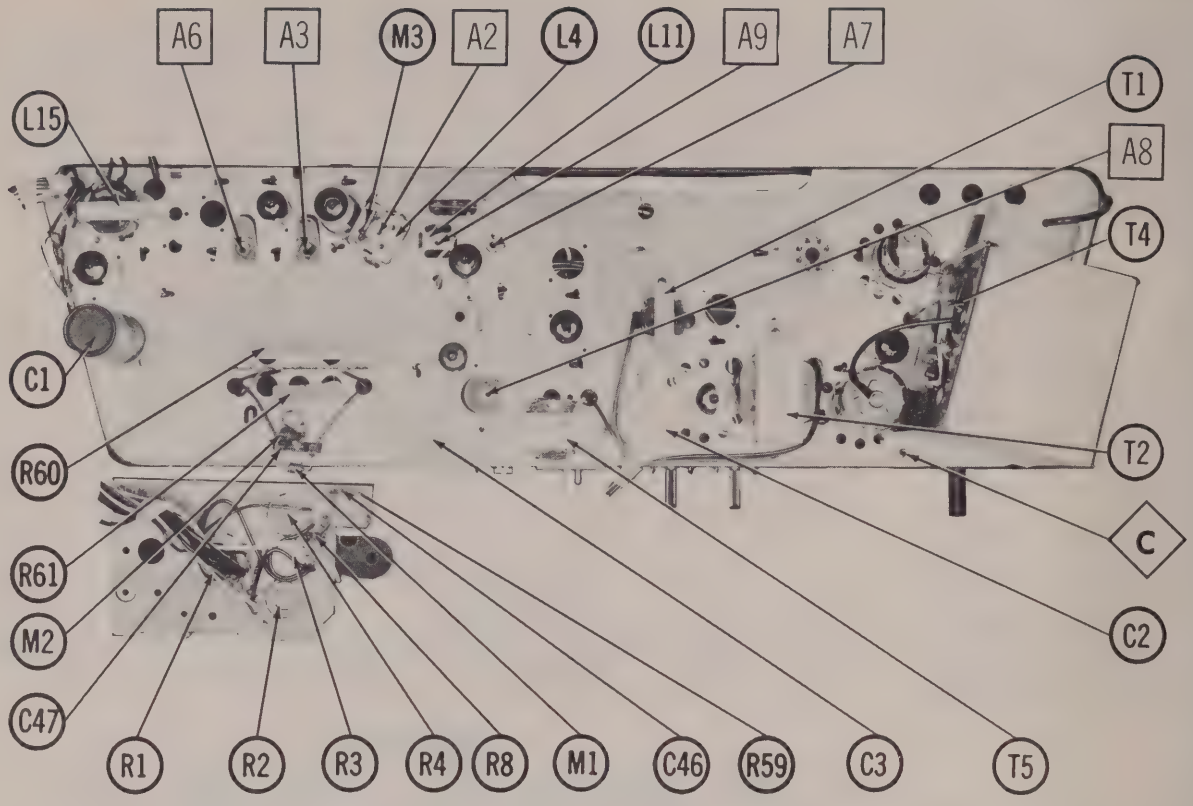
NAME	PART NO.	DESCRIPTION
Safety Glass	17X202-1	Tinted
Mask Assy.	S-38A1010	Mahogany
Mask Assy.	S-38A1018	Oak
Knob	10A979-1	Channel Selector
Knob	10A953-1	Fine Tuning
Knob	10A893-3	UHF Tuning
Knob	10A894-1	UHF Indicator
Knob	10A932-1	On-Off Volume
Knob	10A975-1	Brightness, Range, Vert. Contrast
Knob	10A933-1	Channel Indicator
Dial	58X820-1	

WIRING DATA

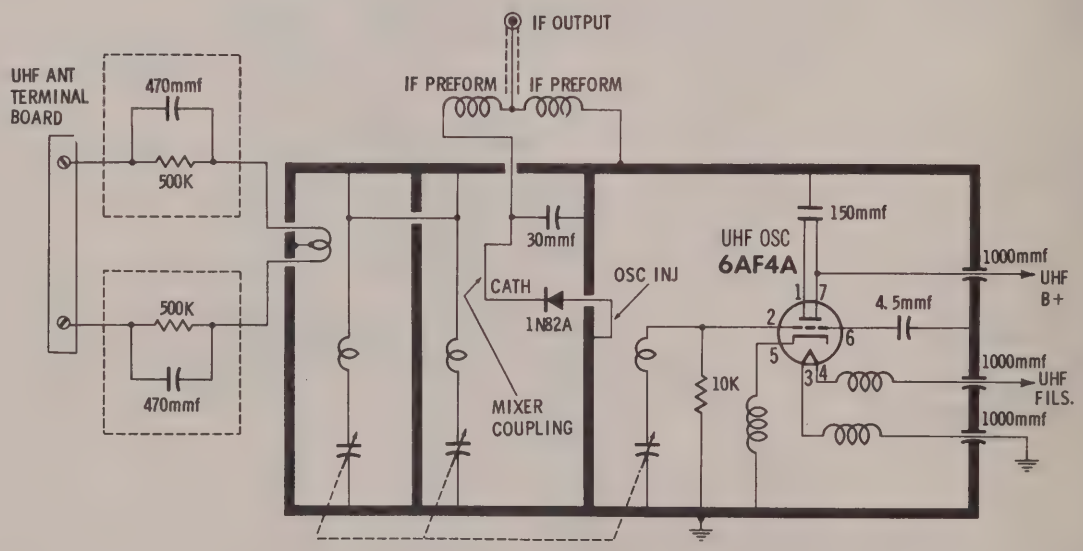
High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8685 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-In	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor

TRUETONE MODELS 2DC1030A, 1032A, 1034A, 1036A, 1038A, 2030A

FOLDER 2



CHASSIS TOP VIEW



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UHF TUNER #25A1159-3

TUNER PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V201	RF Amplifier	2BN4A
V202	Mixer-Osc.	5CG8

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C201	120 N750 10%			TCN-120	C10T120U	CCTN-121	CN7-312	10TCU-T12
C202	30	#13M350U300N-02						
C203A	15 N150 7%	#13L8PG150N2				*		10TCP-Q15
B	15 N150 7%					*		10TCP-Q15
C204	1000		EF-001	MFT-1000		CCF-102	CT280A	
C205	2-10	#31B-206-08		829-10				
C206	47	#13M320U470J-09						
C207	.27 10%	#13D-111-45						
C208	2-6			829-6		VC-3	CT552	
C209	2-6			829-6		VC-3	CT552	
C210	51 N470	#13L-029				*		
C211	1.0 10%		NPO-SI 1.0	TCZ-1			CNO-510	10TCC-V10
C212	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C213	36 5%	#13M350U360J-01						
C214	13 5%			TCZ-12	C10Q13C	CCTO-120	CNO-412	10TCC-Q12
C215	4.7 ±.25mmf		NPO-DI 4.7	DTZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TCC-V47
C216	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C217	1000		EF-001	MFT-1000		CCF-102	CT280A	
C218	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C219	1000		EF-001	MFT-1000		CCF-102	CT280A	
C220								

"Standard Coil" Part Numbers.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R201	4700Ω	
R202	1000Ω	
R203	100K	
R204	220K	
R205	1000Ω	
R206	10K	
R207	15K	
R208	10K	

COILS (RF-IF)

ITEM No.	USE	PART No.	NOTES
L201	Ant. Trans.	31T-3397	
L202	RF Choke	34A-748	
L203	IF Trap Coil	34A-762	
L204	RF Choke	34A-1005	
L205	Ant. RF, Mixer Grid & Osc. Coils	31T-3361-07	Channel 2-13, Includes Rotor.
L206	Fine Tuning Coil	34A-787-03	
L207	Fil. Choke	31K-137-027	
L208	Mixer Plate Coil	31UA-580-017	

Note: Part numbers listed above are "Standard Coil" Part Numbers.

COMPONENT COMBINATIONS

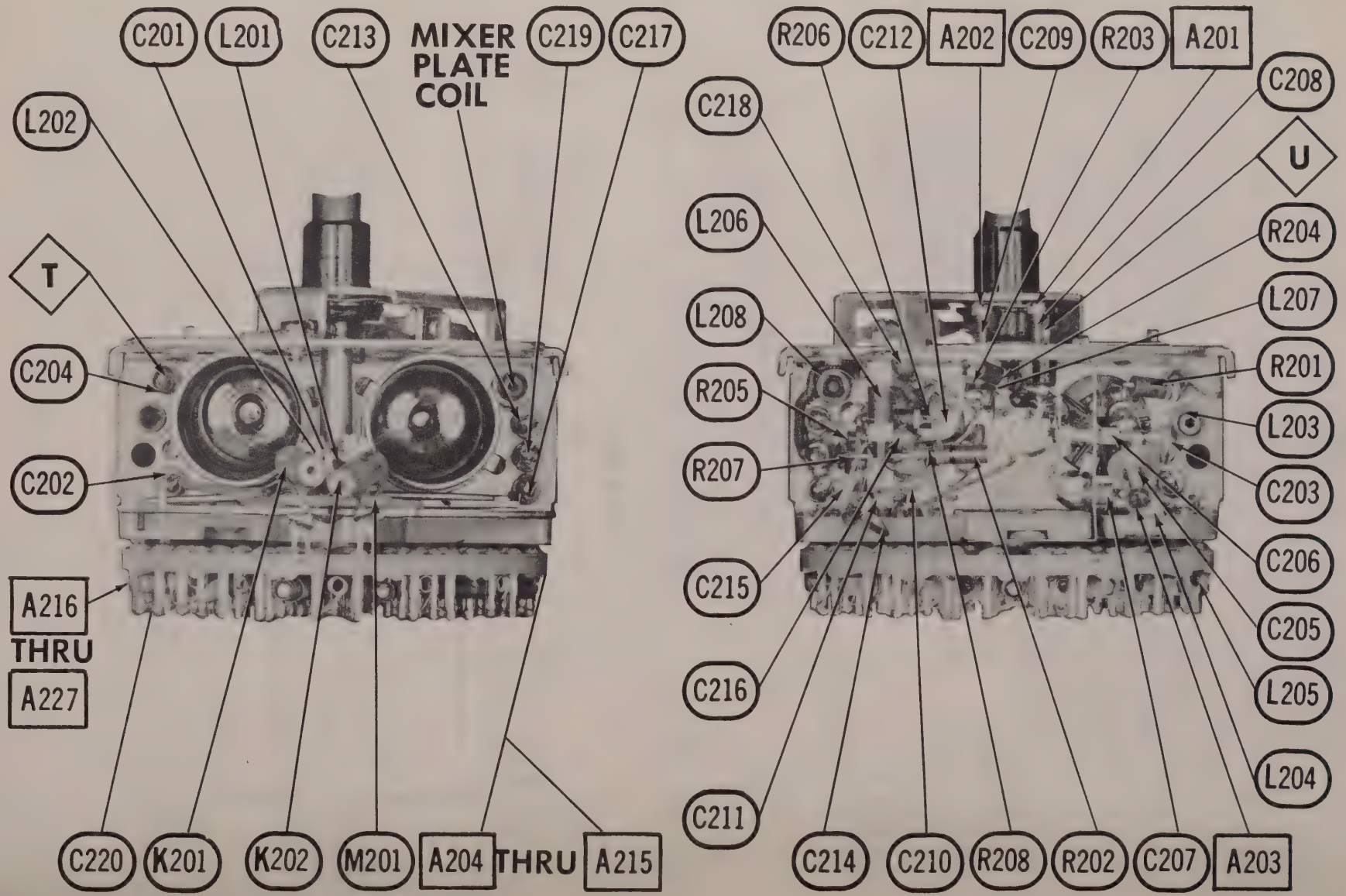
ITEM No.	USE	DESCRIPTION	PART No.	REPLACEMENT DATA
K201	Antenna Isolation	470mmf, .3-1meg	13P-195	Centralab RC-471 Sprague AC1-1
K202	Antenna Isolation	470mmf, .3-1meg	13P-195	Centralab RC-471 Sprague AC1-1

Note: Part numbers listed above are "Standard Coil" Part Numbers.

MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
M201	Antenna Input	31T-3398-06	Assembly
	Fine Tuning Shaft & Cam	31T-3413-019	Assembly

Note: Part numbers listed above are "Standard Coil" Part numbers.



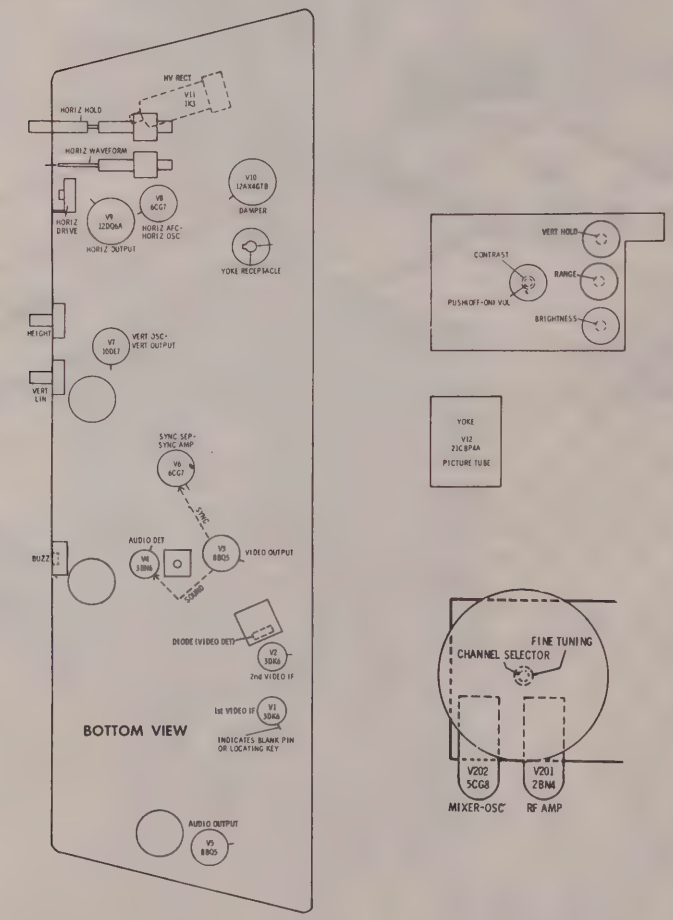
TUNER 25A1185 OR 25A1189

RESISTANCE MEASUREMENTS

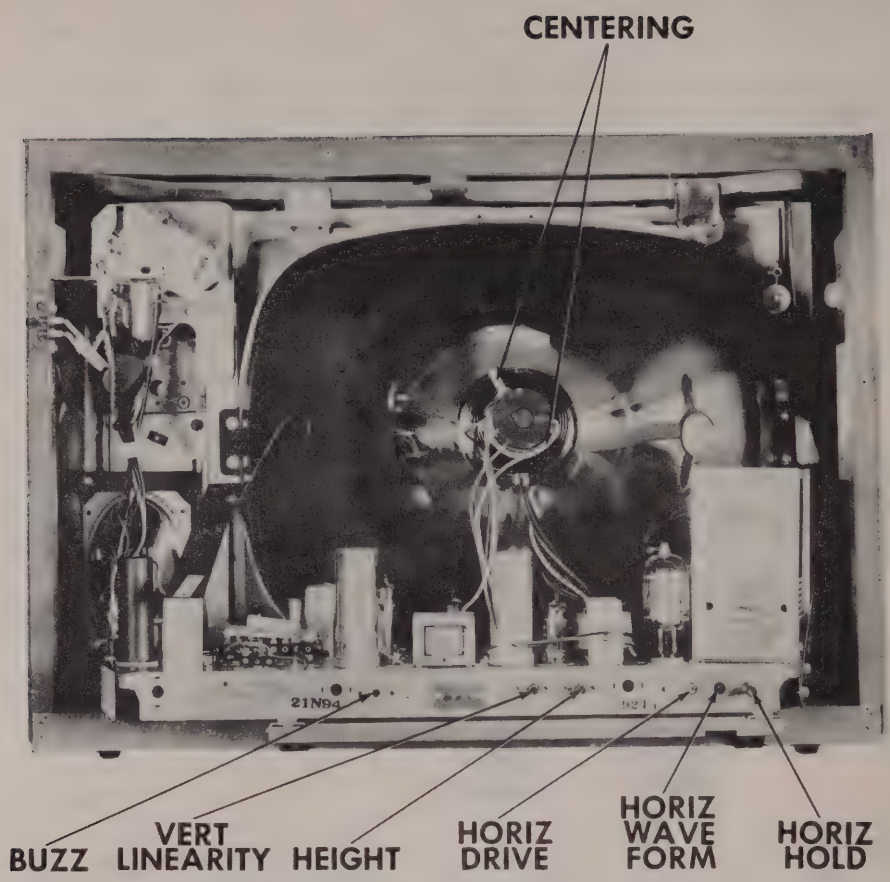
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	3DK6	800K	56Ω	12.5Ω	11.5Ω	†10K	†10K	0Ω		
V2	3DK6	.1Ω	150Ω	11.5Ω	10.5Ω	†3000Ω	†3000Ω	0Ω		
V3	8BQ5	• 1meg	• 1meg	• 140Ω	18Ω	16Ω	NC	†3600Ω	NC	†2500Ω
V4	3BN6	• 250Ω	6Ω	10Ω	10.5Ω	†7200Ω	4.6Ω	†330K		
V5	8BQ5	100Ω	100Ω	150Ω	20Ω	18Ω	NC	†850Ω	NC	†470Ω
V6	6CG7	†1.5meg	2.2meg	0Ω	14.5Ω	16Ω	†14K	40K	0Ω	0Ω
V7	10DE7	†400Ω	2.2meg	2.2meg	12.5Ω	14.5Ω	• †2meg	• 900K	160Ω	• 1800Ω
V8	6CG7	†56K	410K	0Ω	6Ω	4.5Ω	†0Ω	1.5meg	410K	0Ω
V9	12DQ6A	0Ω	7.5Ω	TP	†80K	470K	NC	10Ω	0Ω	TOP CAP †10Ω
V10	12AX4GTB	TP	NC	¶350K	NC	†.2Ω	TP	2Ω ∈	4.5Ω	
V11	1K3	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP †305Ω
V12	21CBP4A	7.5Ω	• 22K	Pin 6 †100K	Pin 10 †10meg	Pin 11 • 300K	Pin 12 6Ω			
V201	2BN4	0Ω	5000Ω	0Ω	.5Ω	†2500Ω	0Ω	5000Ω		
V202	5CG8	10K	†15K	0Ω	2Ω	.5Ω	†2500Ω	†11K	0Ω	320K
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM 270V SOURCE.
‡ MEASURED FROM PIN 3 OF V10.

NC NO CONNECTION
TP TIE POINT



TUBE PLACEMENT CHART



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Suggested Alignment Tools:
B1 .... 1/4" Nut Driver
B2 .... GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545

Tune in a station and adjust the Horizontal Hold until the picture is just about to tear out of sync as can be seen at the top of the picture.

Turn the Contrast control fully counterclockwise and Brightness control clockwise so that the picture appears washed out. Turn the Horizontal Drive trimmer (B1) clockwise until white vertical bars (drive lines) appear in the left center portion of the raster, then counterclockwise until the white bars just disappear.

Connect the vertical amplifier of a scope to point Ⓒ. Low side to chassis. Adjust the Horizontal Waveform slug (B2) until the round and sharp peaks of the waveform are equal in amplitude. See Fig. 4. Keep the picture in sync during this adjustment.

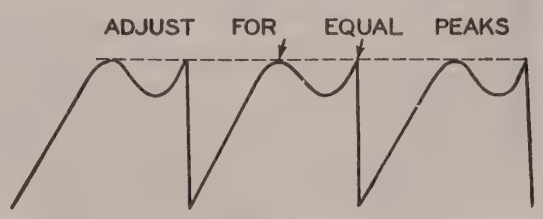


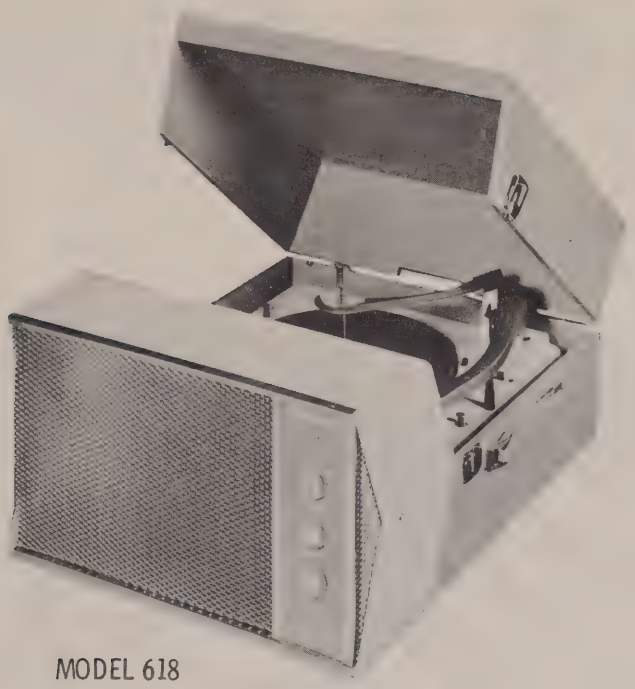
FIG. 4

PHOTOFACT® Folder

EIA

COLUMBIA
MODELS BN220, 618

COLUMBIA
MODELS BN220, 618

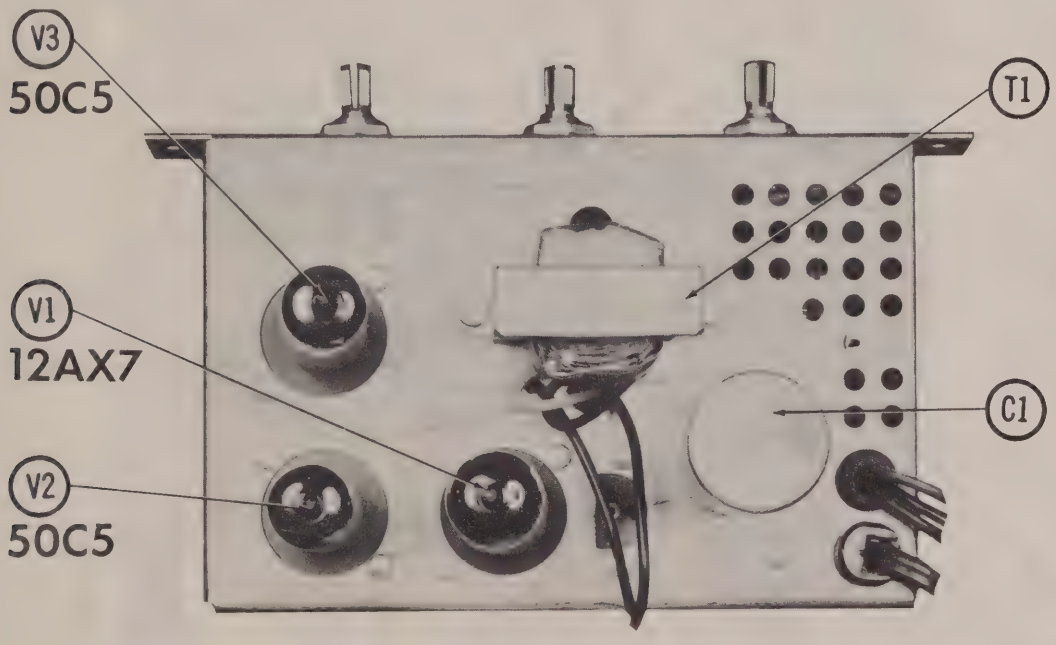


MODEL 618

COLUMBIA
MODELS BN220, 618

TRADE NAME	Columbia Models BN220, 618
MANUFACTURER	CBS Electronics, 100 Endicott St., Danvers, Mass.
TYPE SET	AC Operated 3 Tube Phono Amplifier With 4 Speed Automatic Record Changer
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 30 Watts, .33 Amp. @ 117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER - SEE SIMILAR V-M 1201 - PHOTOFACT SET 436 FOLDER 18



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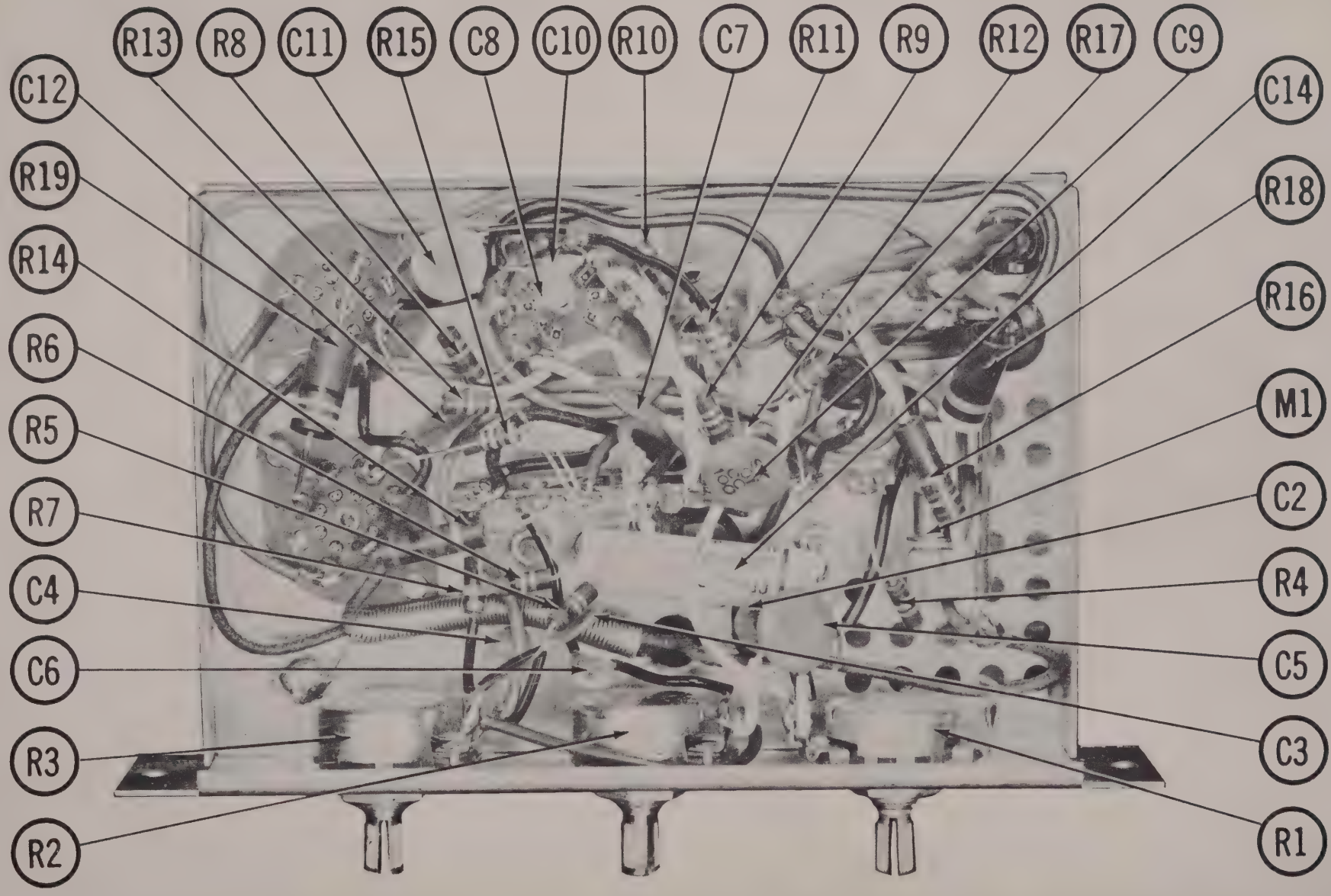
JT485

SET 472 FOLDER 3



CHASSIS - BOTTOM VIEW (MODEL 618)

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V1	AF Amplifier - Phase Inverter	12AX7

ITEM No.	USE	TYPE
V2	Output	50C5
V3	Output	50C5

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	COLUMBIA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	60	150	11B713	PRS3800	BBRT84215	TCT3119	TDLT-7	TVA-3455	
B	40	150							
C	20	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	3000		BPD-003	DD-302	BYA10D3	CCD-302	GP230	5HK-D30
C3	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C4	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C5	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C6	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C7	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C8	1000	Note 1	BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C9	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C10	1000	Note 1	BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C11	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C12	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C13	.5 200V	Note 2	P288N-5		CUB2P5	2DP-5-504	GEM-205	2TM-P5
C14	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5

Note 1. Not used in some versions.

Note 2. Not used in Model BN220.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES	
	RESISTANCE	WATTS	COLUMBIA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.		
R1A	1meg	½	VC-268	BT-72	A47F-1meg	Q13-137X	UT-440	Loudness	Note 1
	250K Tap								
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.		
R2A	1meg	½	VC-107	B-70	A47-1meg-Z	Q13-137	U53	Treble	Note 2
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.		
R3A	1meg	½	VC-107	B-70	A47-1meg-Z	Q13-137	U53	Bass	Note 3
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.		

Note 1. Model BN-220 uses 1meg Volume with Switch (Part #9B602).
Note 2. Model BN-220 uses 1meg Treble (Part #9B601).
Note 3. Model BN-220 uses 1meg Bass (Part #9B601).

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	100K	
R5	10K	
R6	100K	
R7	100K 5%	
R8	10meg	
R9	270K	

ITEM No.	RATING	REMARKS
R10	10meg	
R11	270K	
R12	47K	
R13	470K	
R14	100Ω 1W	
R15	470K	

ITEM No.	RATING	REMARKS
R16	2700Ω 1W	
R17	3300Ω	
R18	47Ω 2W	
R19	47Ω 2W	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	COLUMBIA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	4300Ω CT	3-4Ω	3B236	22S86	A-2900	AU-608	A-3856	22S86	S-51X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	COLUMBIA PART No.	QUAM PART No.	
SP1	8"	PM	3-4Ω	1B111	8A21	
SP2	3½"	PM	3-4Ω	1B112	3A07	

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					
	CURRENT (Measured)	COLUMBIA PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.046A	10B614 ①	5E4 ①	HF-154 ①	M-150 ①	SR-200 ①	① Silicon Type

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA								
	COLUMBIA PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M2	TO-400-OV	118-TS	N8-1 & N8-3			3	CRA-55 CRA-55LP	2T-S	N-2T-S

[redacted] NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	COLUMBIA PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	
M3	(78RPM)	W-64S † or W-64D ♦	CRA-55 † or CRA-55D ♦	† Jewel ♦ Diamond
	(LP)	W-64MGS † or W-64MGD ♦	CRA-55LP † or CRA-55LPD ♦	

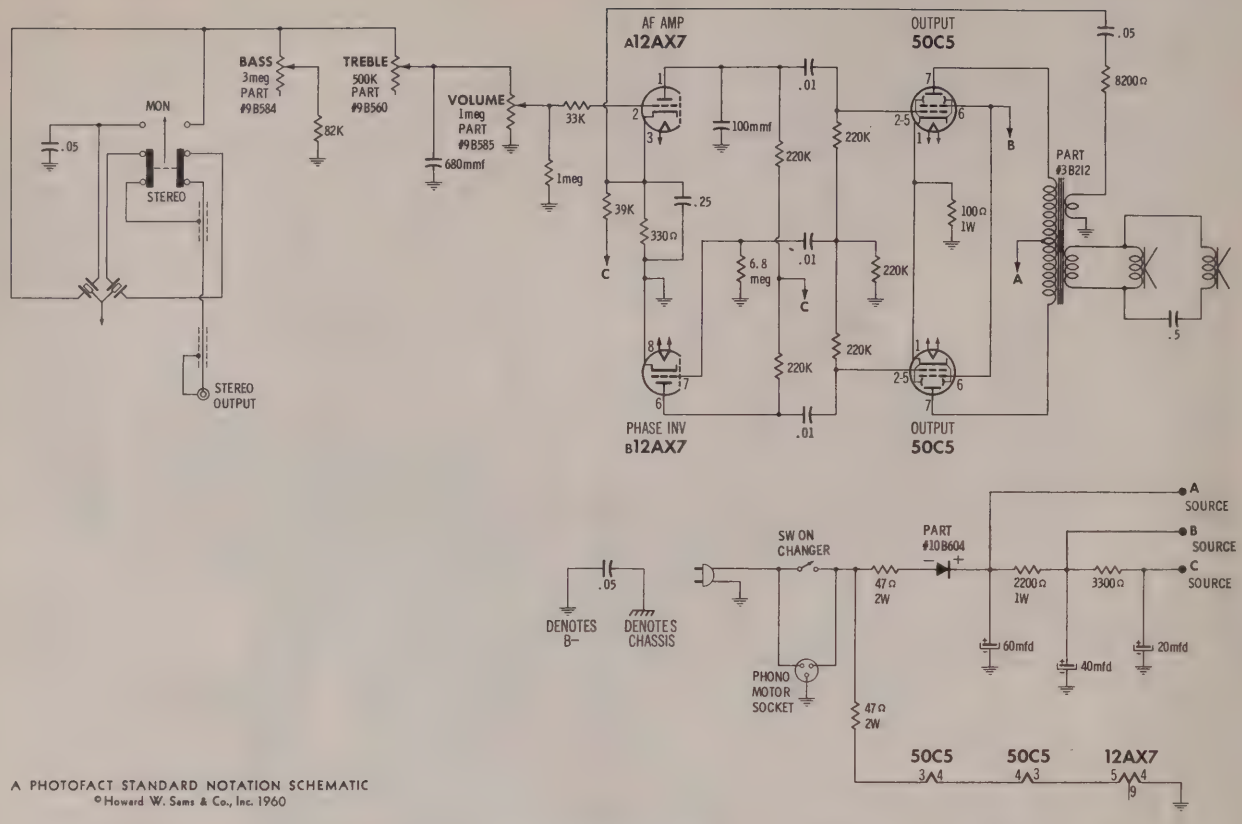
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	8B456	Silver, Model 618
Knob	8B471	With Chrome Insert, Model 618
Knob	8B469	With Brass Insert, Model 618
Knob	8B483	Loudness, Treble, & Bass, Model BN220
Cabinet	17B823	Brown & White, Model 618
Cabinet	17B822	Gray & Red, Model 618
Cabinet	17B811	Metal, Model BN220

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting) .....Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)



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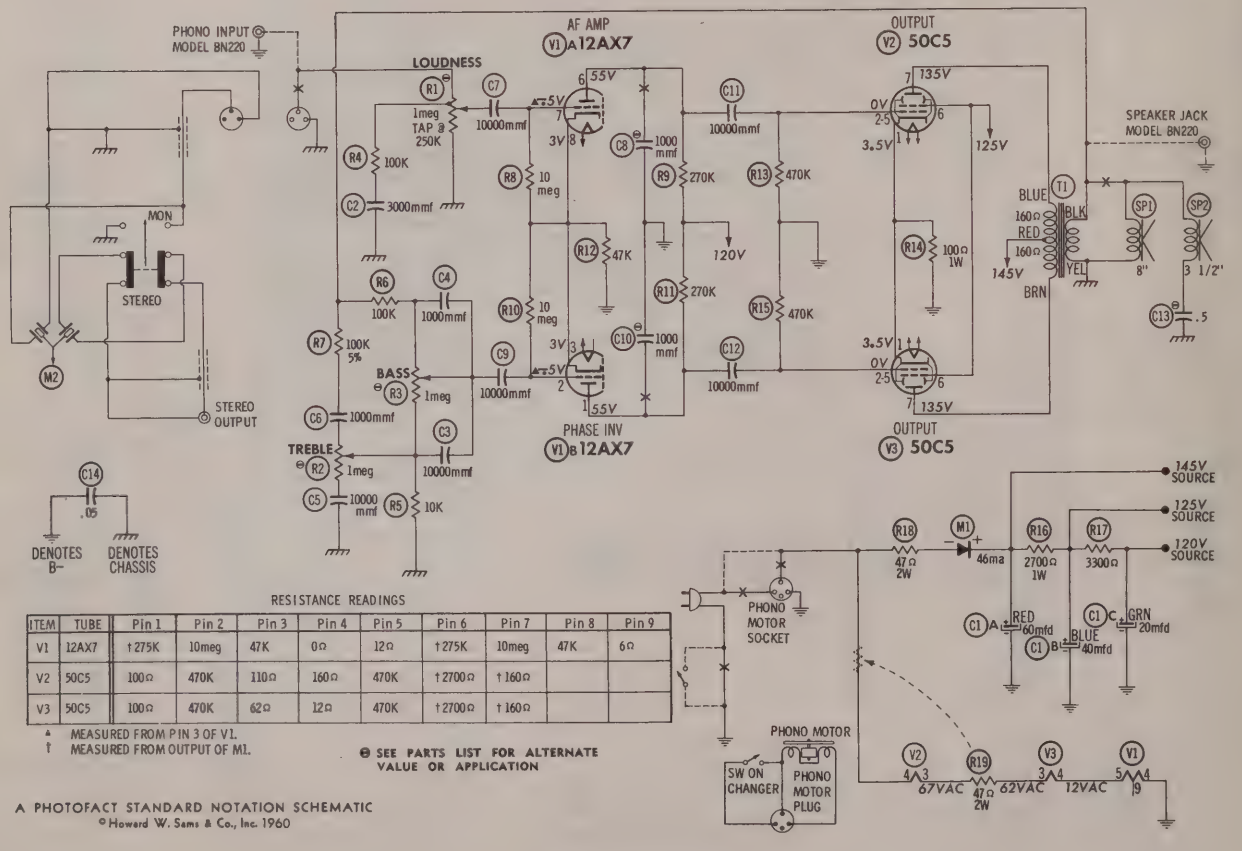
MODEL BN220



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†275K	10meg	47K	0Ω	12Ω	†275K	10meg	47K	6Ω
V2	50C5	100Ω	470K	110Ω	160Ω	470K	†2700Ω	†160Ω		
V3	50C5	100Ω	470K	62Ω	12Ω	470K	†2700Ω	†160Ω		

▲ MEASURED FROM PIN 3 OF V1.
† MEASURED FROM OUTPUT OF M1.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

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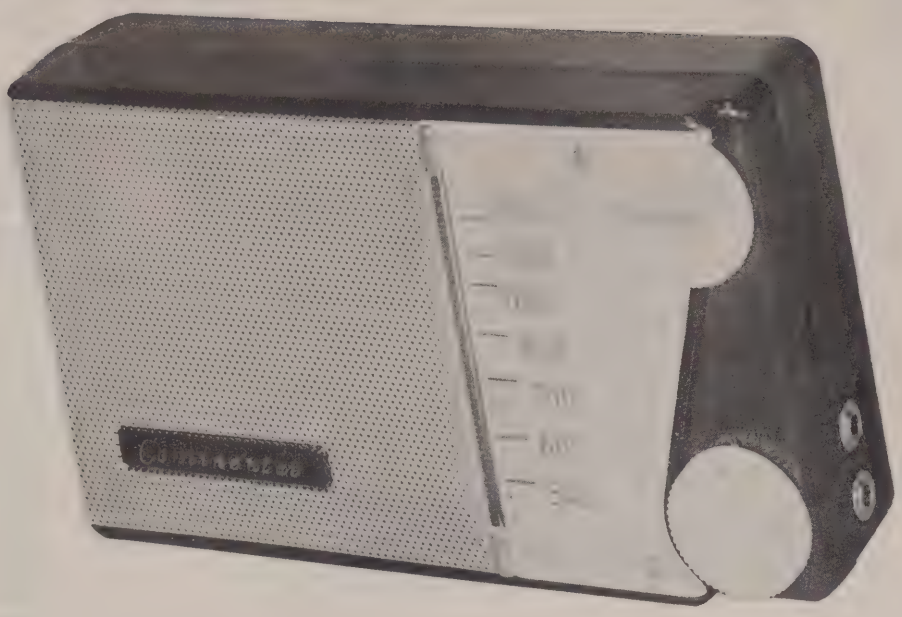
MODEL 618

PHOTOFACT® Folder with CIRCUITRACE*

CONTINENTAL
MODEL TR-215

CONTINENTAL
MODEL TR-215



TRADE NAME	Continental Model TR-215
SUPPLIER	Continental Merchandise Co., 236 Fifth Ave., New York 1, N. Y.
TYPE SET	Battery Operated Transistorized Portable AM Receiver
POWER SUPPLY	6 Volts DC
TUNING RANGE—BROADCAST	535 – 1605KC
RATING	5.5MA @ 6 Volts DC (No Signal, Min. Volume) 15MA @ 6 Volts DC (Signal, Normal Volume)

ALIGNMENT INSTRUCTIONS

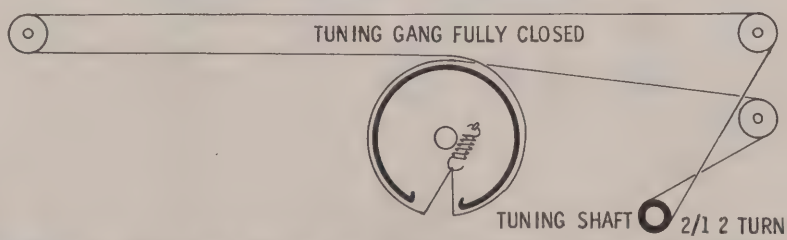
ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools: A4, A6.....GENERAL CEMENT #5000, 5003, 5014, 5015, 5016, 8276, 8290
WALSCO #2512, 2515, 2522, 2523, 2525, 2537

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.		Loop	455KC (400∿ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.		"	1605KC	"	"	A4	"
3.		"	600KC	600KC	"	A5	"
4		"	1400KC	Tune to 1400KC signal.	"	A6	Adjust for maximum output while rocking tuning gang.

DIAL CORD STRINGING



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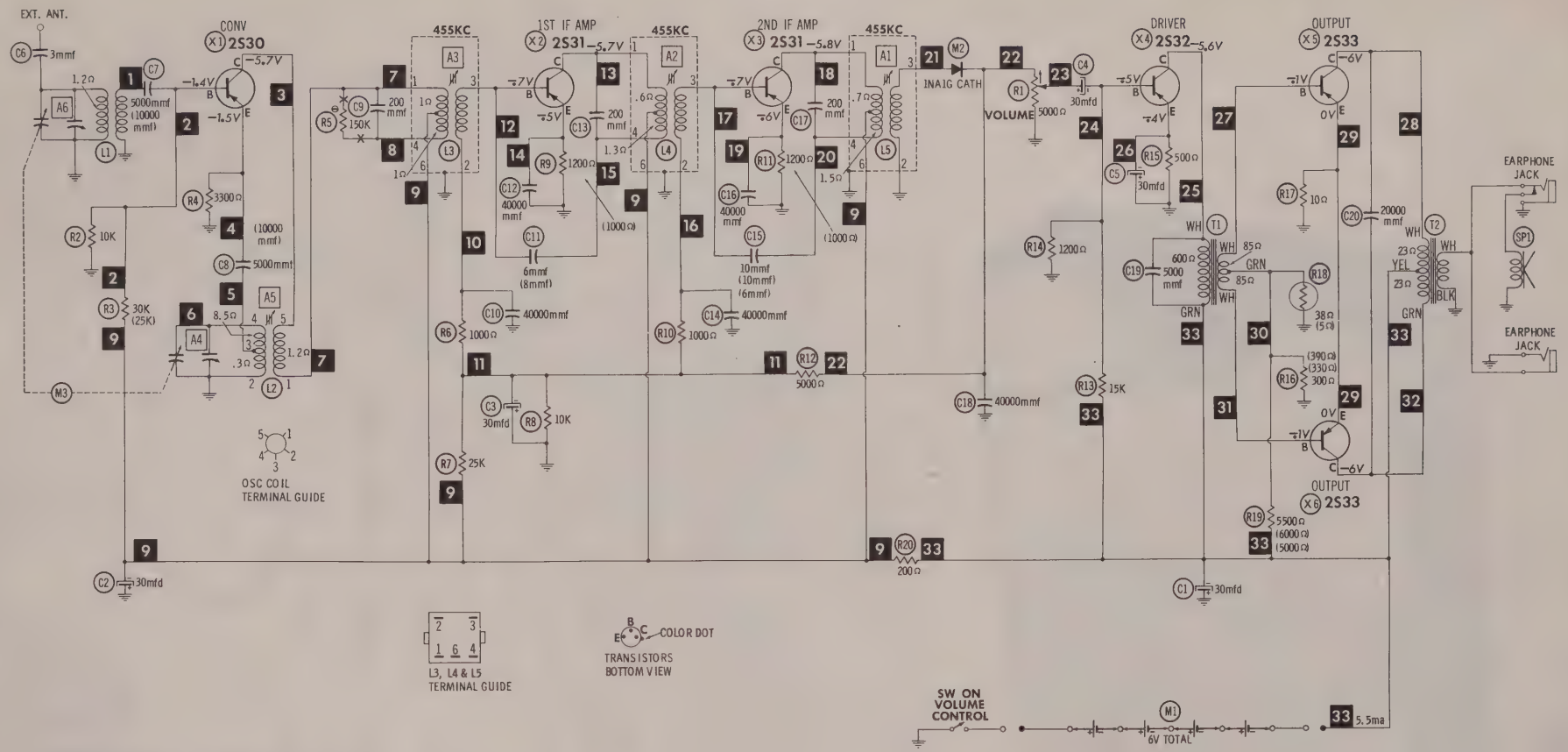
JF450

SET 472 FOLDER 4



NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE®

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CONTINENTAL MODEL TR-215

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2S30	Converter					PNP
X2	2S31	1st IF Amplifier					PNP
X3	2S31	2nd IF Amplifier					PNP
X4	2S32	Driver					PNP
X5	2S33	Output					PNP } Matched
X6	2S33	Output					PNP } Pair

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Continental PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1	30	6		PWE6030	NLW30-6		ML30-6	TE-1092	
C2	30	6		PWE6030	NLW30-6		ML30-6	TE-1092	
C3	30	6		PWE6030	NLW30-6		ML30-6	TE-1092	
C4	30	6		PWE6030	NLW30-6		ML30-6	TE-1092	
C5	30	6		PWE6030	NLW30-6		ML30-6	TE-1092	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C6	3		NPO-SI 3.0	DD-3R3	C10V3C	CCTO-3R3	CNO-533	10TCC-V33
C7	5000	(10000mmf) *	C80V502AM	DDM-502	H-05D5	CCD-502	TA-250	TG-D50
C8	5000	(10000mmf) *	C80V502AM	DDM-502	H-05D5	CCD-502	TA-250	TG-D50
C9	200			DD-201	L10T2	CCD-201	GP320	10TCC-T20
C10	40000		C80V503AM	UK10-503	H-05S5		TA-150	TG-S50
C11	6	(8mmf,10mmf)*	NPO-SI 6.8	DD-060	C10V6C	CCTO-6R8	CNO-568	5GA-V60
C12	40000		C80V503AM	UK10-503	H-05S5		TA-150	TG-S50
C13	200			DD-201	L10T2	CCD-201	GP320	10TCC-T20
C14	40000		C80V503AM	UK10-503	H-05S5		TA-150	TG-S50
C15	10	(6mmf) *	C80V503AM	UK10-503	H-05S5		TA-150	TG-S50
C16	40000		C80V503AM	UK10-503	H-05S5		TA-150	TG-S50
C17	200			DD-201	L10T2	CCD-201	GP320	10TCC-T20
C18	40000		C80V503AM	UK10-503	H-05S5		TA-150	TG-S50
C19	5000		C80V502AM	DDM-502	H-05S5	CCD-502	TA-250	TG-D50
C20	20000		C80V203AM	DA-203	H-05S2	CCD-203	TA-120	TG-S20

* Alternate Value

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Continental PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	5000Ω	.2	33.11T					Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	10K	
R3	30K	(25K) *
R4	3300Ω	
R5	150K	Note 1
R6	1000Ω	
R7	25K	
R8	10K	

ITEM No.	RATING	REMARKS
R9	1200Ω	(1000Ω) *
R10	1000Ω	
R11	1200Ω	(1000Ω) *
R12	5000Ω	
R13	15K	
R14	1200Ω	
R15	500Ω	

ITEM No.	RATING	REMARKS
R16	300Ω	(390Ω) (330Ω) *
R17	10Ω	(5Ω) *
R18	38Ω	
R19	5500Ω	(6000Ω) (5000Ω) *
R20	200Ω	

* Alternate Value

Note 1. Not used in some versions.

PRINTED BOARD

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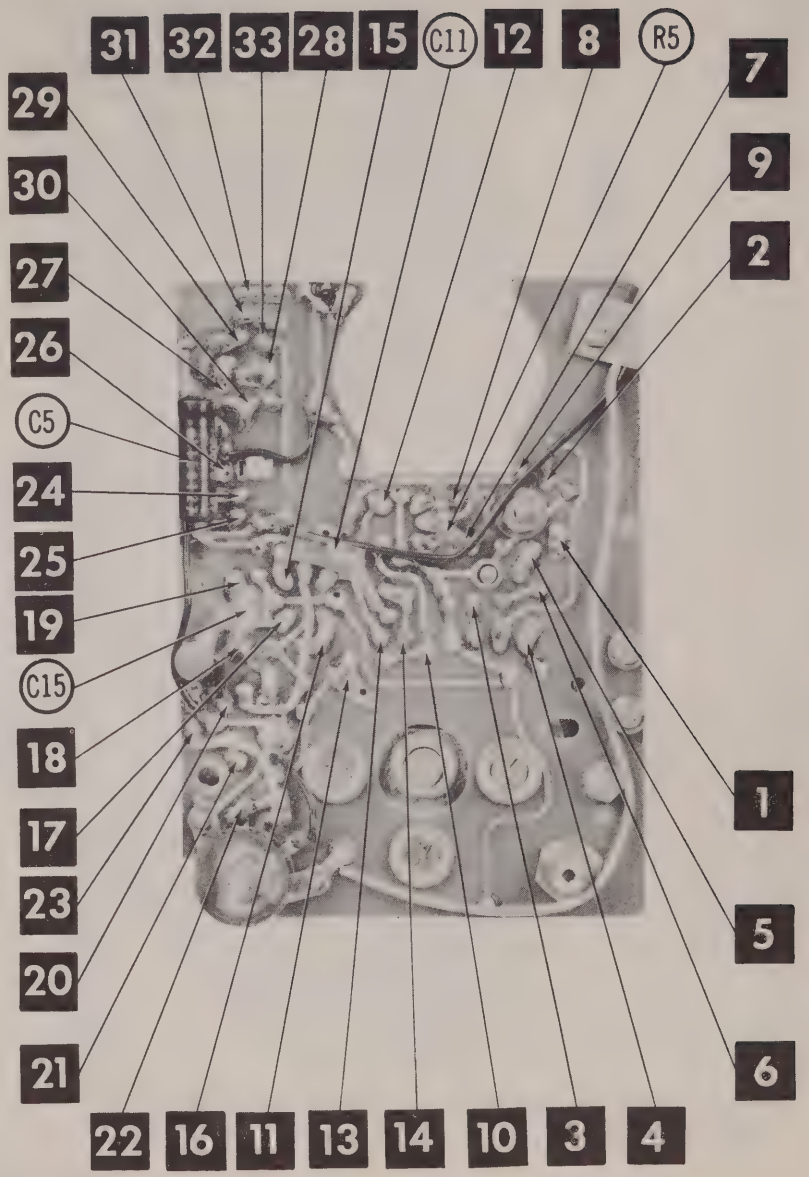


PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		Continental PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1 L2 L3 L4 L5	Loopstick Osc. Coil 1st IF Trans. 2nd IF Trans. 3rd IF Trans.							

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Continental PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	1.5	1	T-442-C	TR-4		TA-28	TR-4		

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	Continental PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	400Ω	10Ω	T-455A	TR-19			TA-37	TR-19		

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Continental PART No.	QUAM PART No.	
SP1	2½"	PM	8-10Ω	DM-251A		

BATTERIES

ITEM No.	VOLTAGE	Continental PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	1.5V	UM-3A		230		A100		M-13R	4 Required

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		Continental PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2	1NA1G		1N60	1N295	1N295	Detector (Pigtail)

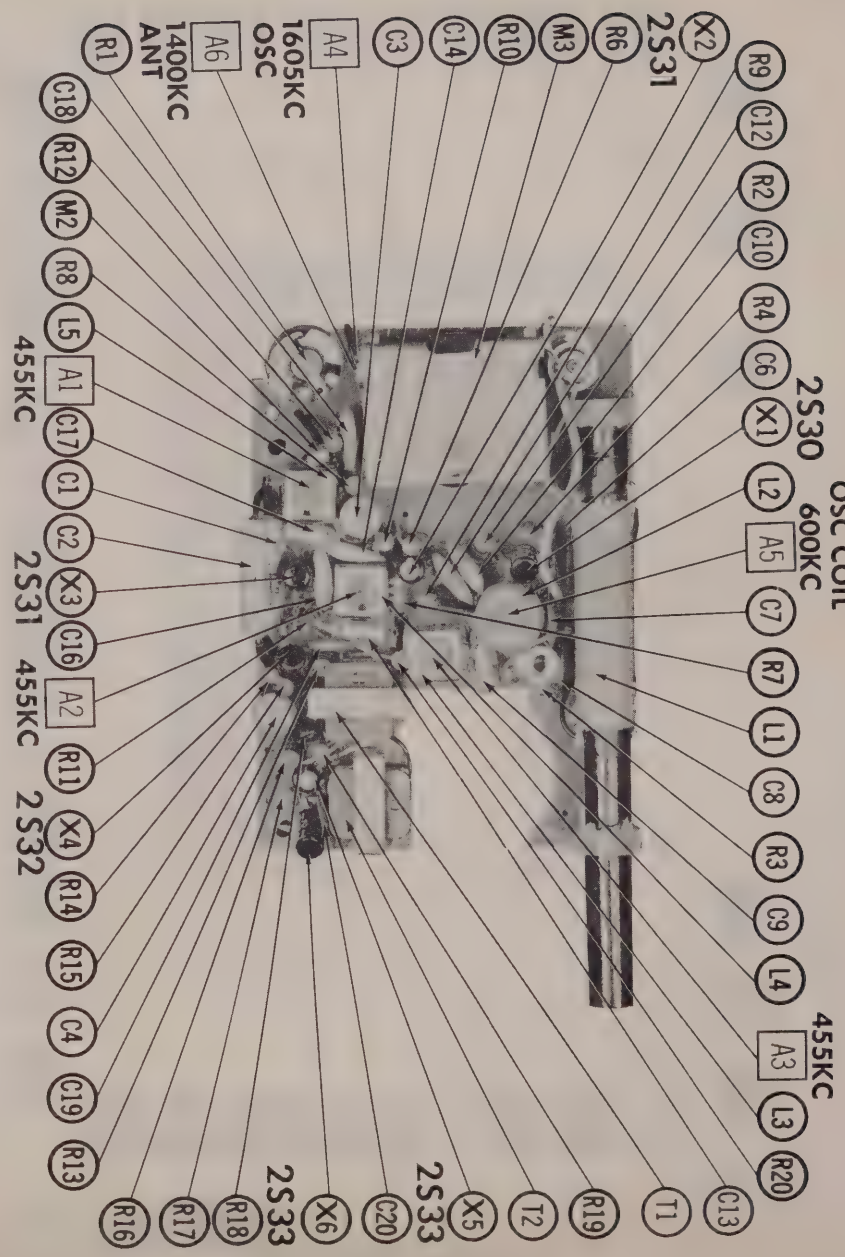
MISCELLANEOUS

ITEM No.	PART NAME	Continental PART No.	NOTES
M3	Tuning Cap.		2 Gang (Ant. 13—190mmf, Osc. 5—55mmf.)

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

CHASSIS—TOP VIEW



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EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

GROMMES
MODEL 240

GROMMES
MODEL 240

GROMMES
MODEL 240

TRADE NAME	Grommes Model 240		
MANUFACTURER	Precision Electronics Inc., 9101 King Ave., Franklin Park, Illinois		
TYPE SET	AC Operated 9 Tube Stereo Amplifier		
POWER SUPPLY	110-120 Volts AC, 60 Cycles	RATING	120 Watts, 1.3 Amp. @ 117 Volts AC

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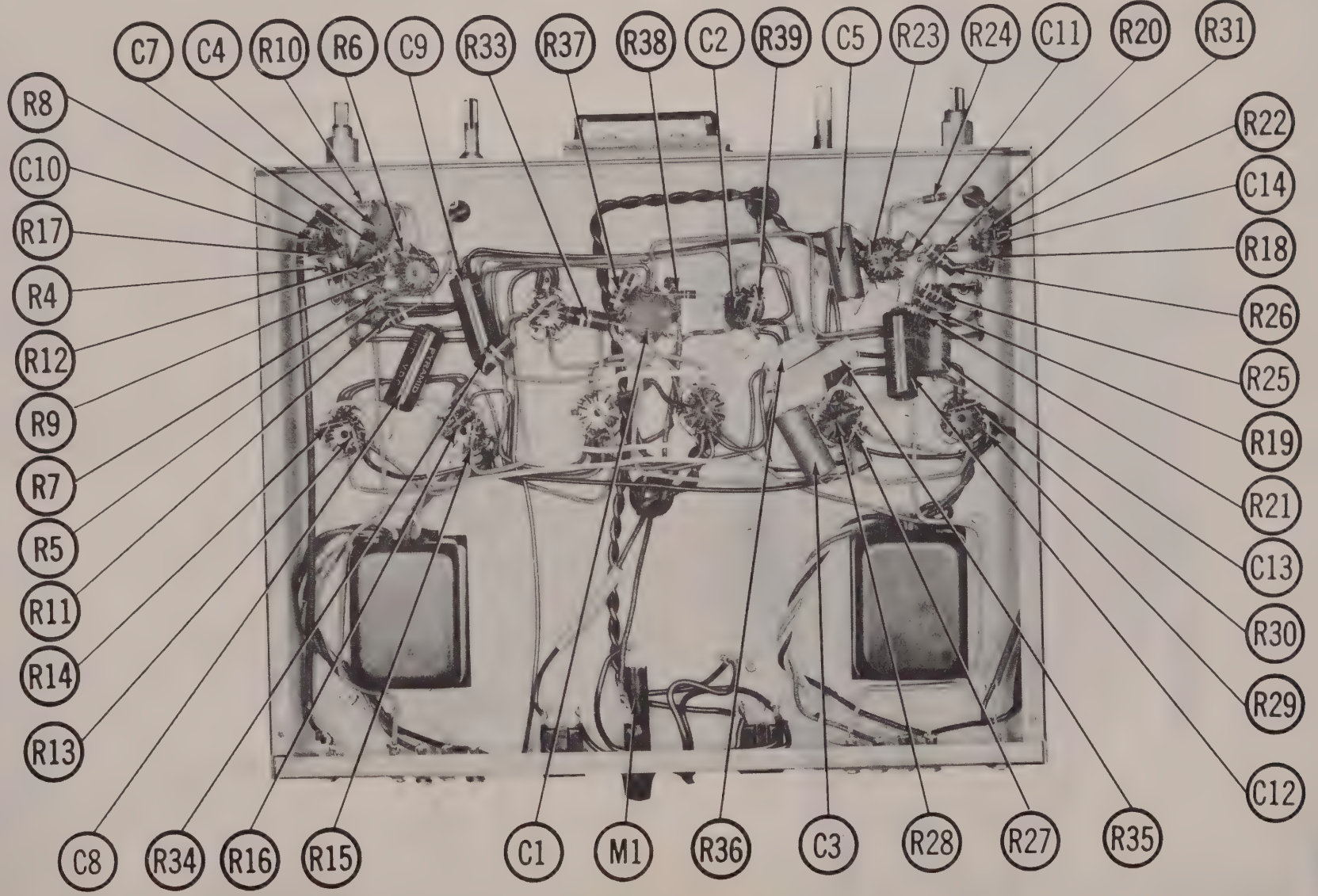
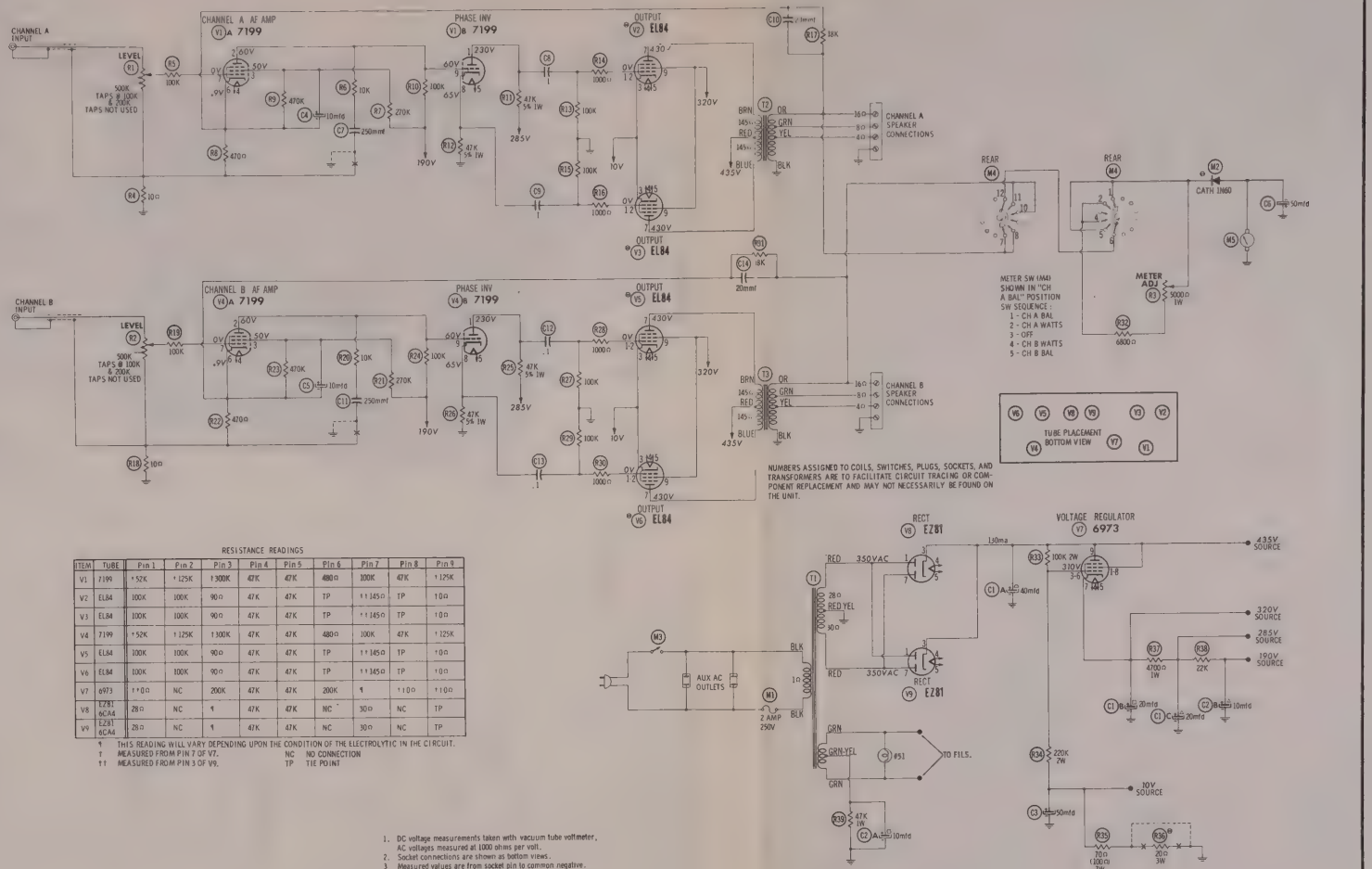


CHASSIS BOTTOM VIEW



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	7199	¶52K	¶125K	¶300K	47K	47K	480Ω	100K	47K	¶125K
V2	EL84	100K	100K	90Ω	47K	47K	TP	††145Ω	TP	†0Ω
V3	EL84	100K	100K	90Ω	47K	47K	TP	††145Ω	TP	†0Ω
V4	7199	¶52K	¶125K	¶300K	47K	47K	480Ω	100K	47K	¶125K
V5	EL84	100K	100K	90Ω	47K	47K	TP	††145Ω	TP	†0Ω
V6	EL84	100K	100K	90Ω	47K	47K	TP	††145Ω	TP	†0Ω
V7	6973	††0Ω	NC	200K	47K	47K	200K	¶	††0Ω	††0Ω
V8	EZ81 6CA4	28Ω	NC	¶	47K	47K	NC	30Ω	NC	TP
V9	EZ81 6CA4	28Ω	NC	¶	47K	47K	NC	30Ω	NC	TP

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V7. NC NO CONNECTION
†† MEASURED FROM PIN 3 OF V9. TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings
6. All controls at minimum, proper output load connected.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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GROMMES
MODEL 240

PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE
V1	Channel A AF Amplifier - Channel A Phase Inverter	7199
V2	Channel A Output	EL84 (6BQ5, 7189) *
V3	Channel A Output	EL84 (6BQ5, 7189) *
V4	Channel B AF Amplifier - Channel B Phase Inverter	7199
V5	Channel B Output	EL84 (6BQ5, 7189) *
V6	Channel B Output	EL84 (6BQ5, 7189) *
V7	Voltage Regulator	6973
V8	Rectifier	EZ81/6CA4
V9	Rectifier	EZ81/6CA4

* Alternate

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	GROMMES PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500K *	1/2	LCK-500K	BT-160		Q18-133XX	UDT-283	Level, Channel A
B	Shaft			Not Req.		Not Req.	Not Req.	
R2A	500K *	1/2	LCK-500K	BT-160		Q13-133XX	UDT-283	Level, Channel B
B	Shaft			Not Req.		Not Req.	Not Req.	
R3	5000Ω	1(WW)			39-5000	112-5000	FL5K	Meter Adjust

* Taps ② 100K & 200K.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	GROMMES PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	450		AFH3-50-05	C0372	FP396.1	TMQ-90	TVL-4731	
B	■20	450							
C	▲20	450		AFH2-47	B0370	FP231	TMD-47	TVL-2750	
C2A	■10	350							
B	▲10	350		PRS50V50	BR505	TC39	TD-50-50	TVA-1308	
C3	50	50		PRS350V10	BR1045	TC52	TD-10-250	TVA-1504	
C4	10	250		PRS350V10	BR1045	TC52	TD-10-250	TVA-1504	
C5	10	250		PRS50V50	BR505	TC39	TD-50-50	TVA-1308	
C6	50	50							

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	10Ω	
R5	100K	
R6	10K	
R7	270K	
R8	470Ω	
R9	470K	
R10	100K	
R11	47K 5% 1W	
R12	47K 5% 1W	
R13	100K	
R14	1000Ω	
R15	100K	

* Alternate

ITEM No.	RATING	REMARKS
R16	1000Ω	
R17	18K	
R18	10Ω	
R19	100K	
R20	10K	
R21	270K	
R22	470Ω	
R23	470K	
R24	100K	
R25	47K 5% 1W	
R26	47K 5% 1W	
R27	100K	

Note 1. Not used in some versions.

ITEM No.	RATING	REMARKS
R28	1000Ω	
R29	100K	
R30	1000Ω	
R31	18K	
R32	6800Ω	
R33	100K 2W	
R34	220K 2W	
R35	70Ω 7W	(100Ω) *
R36	20Ω 3W	Note 1
R37	4700Ω 1W	
R38	22K	
R39	47K 1W	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C7	250		DI-250	DD-251	L10T25	CCD-251	UC-5325	5GA-T25
C8	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C9	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C10	20		SI 20	D6-200	L10Q2	CCD-200	ZT-542	5GA-Q2
C11	250		DI-250	DD-251	L10T25	CCD-251	UC-5325	5GA-T25
C12	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C13	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C14	20		SI 20	D6-200	L10Q2	CCD-200	ZT-542	5GA-Q2

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	GROMMES PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V ② 1.3A	700VCT ② .130A	6.3VCT ② 5.8A	TP-14		P-2954 ①				R-16B ①

① Use original mounting brackets.

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA GROMMES PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	9000Ω CT	16Ω Taps ⓐ 8Ω, 4Ω	TO-20C	22S93 ①	A-3132 ①		A-3311 ①	22S93 ①	S-31A ①	① Use of original shields
T3	9000Ω CT	16Ω Taps ⓐ 8Ω, 4Ω	TO-20C	22S93 ①	A-3132 ①		A-3311 ①	22S93 ①	S-31A ①	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA GROMMES PART No. FUSE	GROMMES PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG	5A 250V			312005 (3AG 5A 250V)	342001	AGC5	HKP

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA GROMMES PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	NOTES
M2	1N60 *		1N60	1N60	1N295	Meter Rect. (Pigtail)

* Alternate Type 1N541.

MISCELLANEOUS

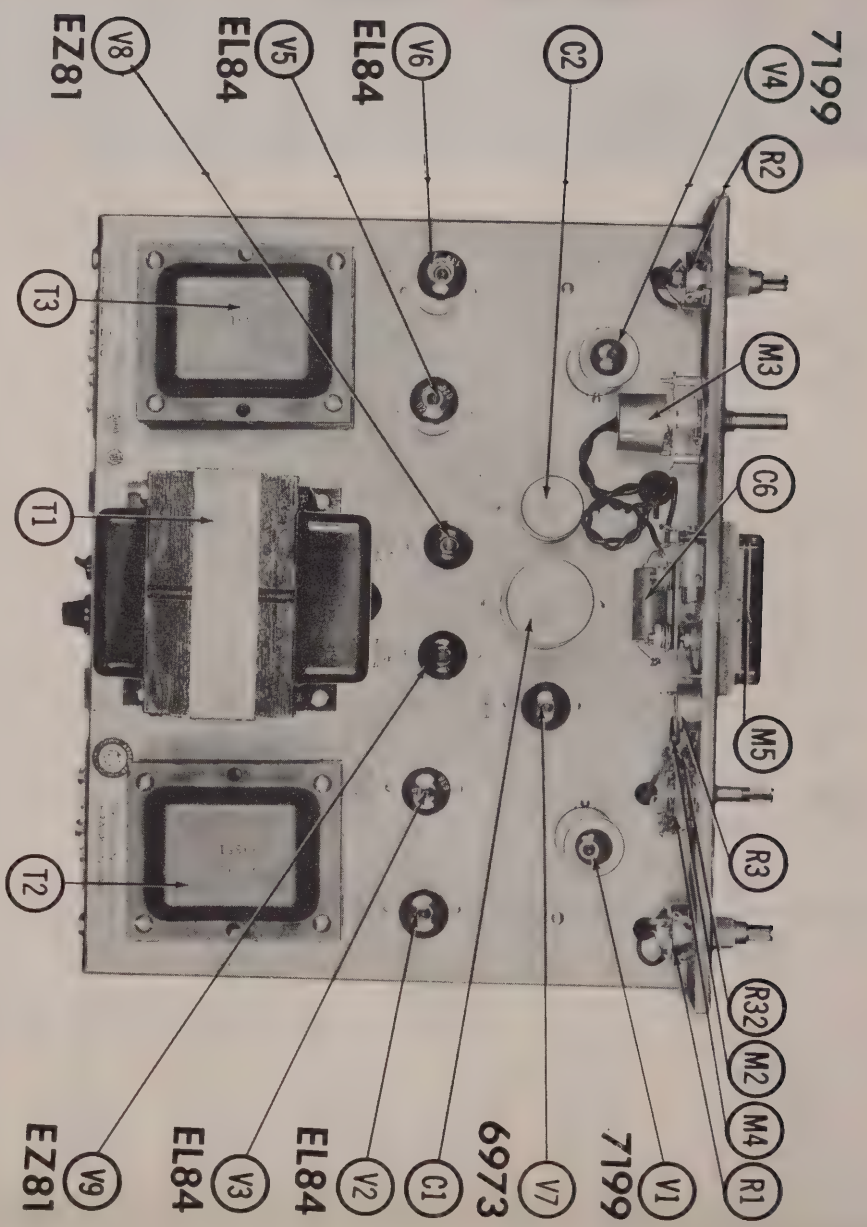
ITEM No.	PART NAME	GROMMES PART No.	NOTES
M3	Switch		Power, Off-On
M4	Switch		
M5	Meter		

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

CHASSIS—TOP VIEW



PHOTOFACT® Folder

MOTOROLA MODELS SK25B, M, MC, MCH (Ch. HS-590, HS-607, HS-738, HS-755)

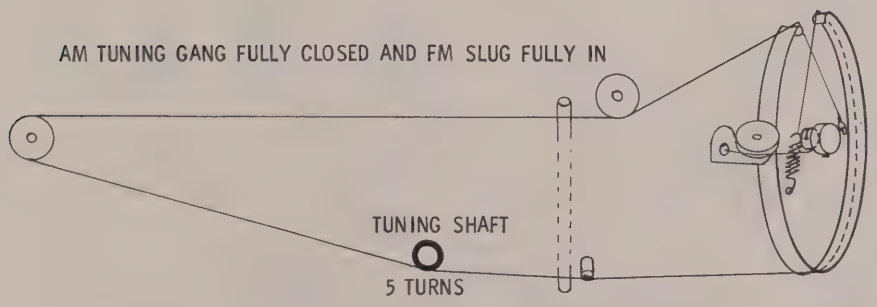
MOTOROLA MODELS SK25B, M, MC, MCH (Ch. HS-590, HS-607, HS-738, HS-755)

MODEL SK25MC

TRADE NAME	Motorola Models SK25B, SK25M, SK25MC, SK25MCH Chassis HS-590 FM-AM Tuner HS-738 Left Channel Amplifier HS-755 Preamplifier HS-607 Right Channel Amplifier
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Illinois
TYPE SET	AC Operated 19 Tube FM-AM Receiver With 4 Speed Automatic Stereo Record Changer
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 210 Watts, 1.95 Amp. @ 117 Volts AC
TUNING RANGE	BROADCAST 535 - 1620KC FREQ. MOD. 88 - 108MC

FOR SERVICE INFORMATION ON VM24RC RECORD CHANGER - SEE SIMILAR V-M 1200A - PHOTOFACT SET 353 FOLDER 16 OR RECORD CHANGER MANUAL RC-10

DIAL CORD STRINGING



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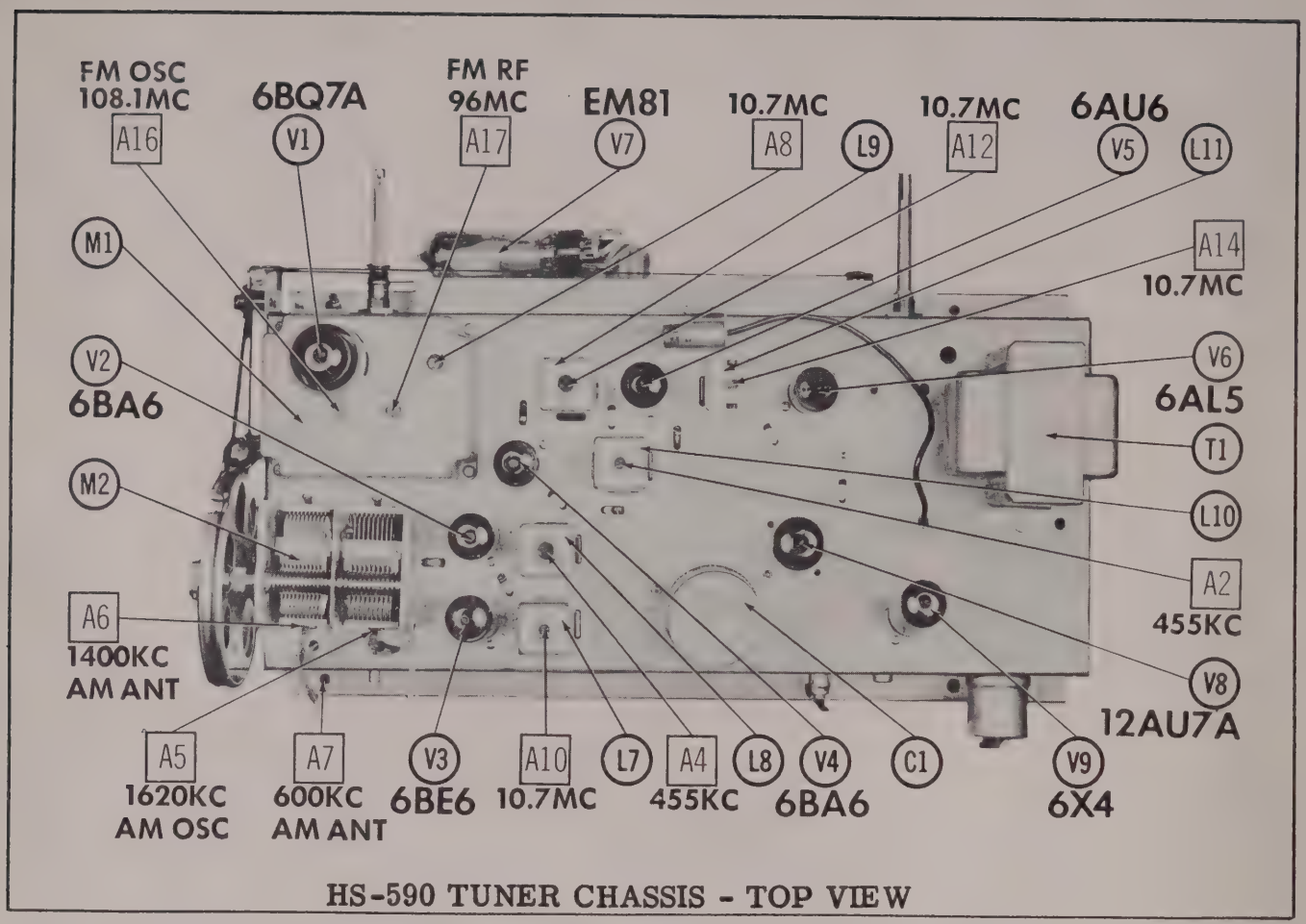
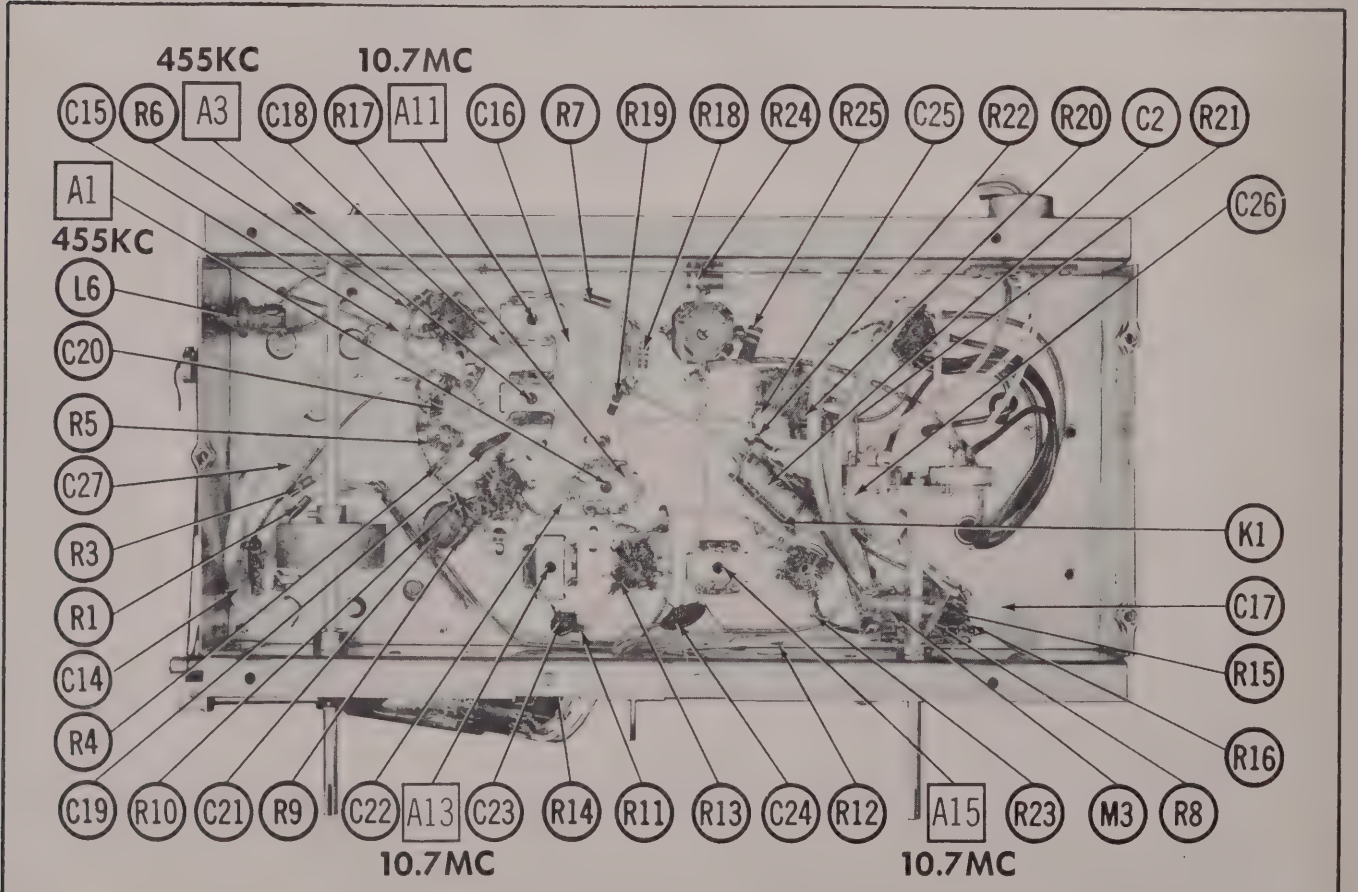


HS-590 TUNER CHASSIS - TOP VIEW



HS-590 TUNER CHASSIS - BOTTOM VIEW

TUNER ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

When the tuning indicator is used as an indicator, reduce signal generator output so that the tuning indicator pattern does not completely close: to prevent overloading.

Suggested alignment tools:

A1 thru A4, A8, A9.....	GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987 WALSCO #2531
A5, A6.....	GENERAL CEMENT #5004, 5008, 5009 WALSCO #2520
A10 thru A15.....	GENERAL CEMENT #5097, 8727 WALSCO #2515
A16, A17.....	GENERAL CEMENT #5000, 5003, 5014, 5015, 5016, 8276, 8290 WALSCO #2512, 2515, 2522, 2523, 2525, 2537

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.1mfd	High side to pin 7 (grid) of AM Converter.	455KC (Unmod.)	AM	Tuning gang fully open.	Not Used.	A1, A2, A3, A4	Adjust for maximum close of tuning eye.
2.		Loop	1620KC	"	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum close of tuning eye.
3.		"	1400KC	"	Tune for maximum close of tuning eye.	"	A6	Adjust for maximum close of tuning eye.
4.		"	600KC	"	"	"	A7	Adjust for maximum close of tuning eye. Repeat Steps 3 and 4.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
5.		Across FM antenna terminals.	10.7MC (Unmod.)	FM	Tuning gang fully open.	Not Used	A8, A9, A10, A11, A12, A13, A14	Adjust for maximum close of tuning eye.
6.		"	"	"	"	DC probe to point Ⓐ. Common to chassis.	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. Repeat Steps 5 and 6.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
5.		Across FM antenna terminals.	10.7MC (450KC Swp)	FM	Tuning gang fully open.	Vert. amp. to point Ⓑ. Low side to chassis.	A8, A9, A10, A11, A12, A13, A14	Disconnect stabilizing capacitor C2. Adjust for maximum gain and symmetry of response similar to Fig. 1. Reconnect C2.
6.		"	"	"	"	Vert. amp. to point Ⓐ. Low side to chassis.	A15	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A14 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
7.		Across FM antenna terminals.	108.1MC (Unmod.)	FM	Tuning gang fully open.	Not Used.	A16	Adjust for maximum close of tuning eye.
8.		"	96MC	"	Tune for maximum close of tuning eye.	"	A17	"
	If FM tuner string has been replaced or tampered with, perform the following steps.							
9.		Across FM antenna terminals.	110MC (Unmod.)	FM	No tension on tuning string.	Not Used	A16	Adjust for maximum close of tuning eye.
10	Set generator at 109.5MC. With tuning gang fully open, place tuning string and collar on tuning shaft, turn collar clockwise for maximum close of tuning indicator. Tighten both set screws. Repeat Steps 7 and 8.							

FIG. 1

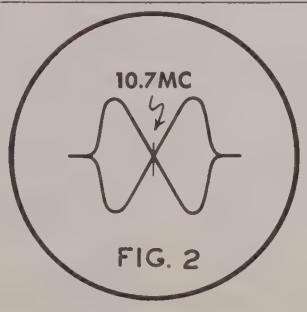


FIG. 2

HS-590 TUNER PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V1	FM RF Amp. - FM Conv.	6BQ7A
V2	1st FM IF Amplifier	6BA6
V3	AM Converter	6BE6
V4	2nd FM IF Amp. - 1st AM IF Amplifier	6BA6
V5	FM Limiter	6AU6
V6	Ratio Detector	6AL5
V7	Tuning Indicator	EM81
V8	AM Det. - AVC - Cathode Follower	12AU7A
V9	Rectifier	6X4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	150	23B638449	AFH3-11-50	D0290	FP330.9	TMT-122	TVL-3442.1	
B	■50	150		MW-4					
C	▲50	150							
C2	8	50	23A638536	PRS1405	BBR8-150	TC41	TD-8-150	TVA-1405	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	10 N750		N750-SI 10	TCN-10	C10Q1U	CCTN-100	CN7-410	10TCU-Q10
C4		#20K640023						
C5	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C6	20		NPO-SI 20	TCZ-20	C10Q2C	CCTO-200	ZT-542	10TCC-Q20
C7	20		NPO-SI 20	TCZ-20	C10Q2C	CCTO-200	ZT-542	10TCC-Q20
C8		#20K640025				*		
C9	10 N470	#21K640026						
C10	15		NPO-SI 15	TCZ-15	C10Q15C	CCTO-150	CNO-415	10TCC-Q15
C11	8.2 P100	#21K640027				*		
C12	68 N750		N750-SI 68	TCN-68	C10Q68U	CCTN-680	CN7-468	10TCU-Q68
C13	1000	Note 1	SI 1000	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C14	10000	Note 1	BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C15	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C16	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5
C17	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C18	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C19	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C20	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C21	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C22	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C23	47 N750		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C24	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C25	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C26	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C27	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10

Motorola Part Number Note 1. Not used in some versions.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R1	10K	
R2	1meg	
R3	10K	
R4	1000Ω	
R5	150Ω	
R6	22K	
R7	2.2meg	
R8	2700Ω	

ITEM No.	RATING	REMARKS
R9	1000Ω	
R10	82Ω	
R11	100K	
R12	10K	
R13	82Ω	
R14	1meg	
R15	4.7meg	
R16	1meg	
R17	47K	

ITEM No.	RATING	REMARKS
R18	270K	
R19	220K	(270K) *
R20	1meg	
R21	1000Ω	
R22	47K	
R23	47K	
R24	330Ω 1W	
R25	330Ω 1W	

* Alternate Value.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	MOTOROLA PART No.	REPLACEMENT DATA
K1	Ratio Detector Network	(3) 300mmf, 1000mmf, 68Ω, 1000Ω, 1500Ω, (2) 6800Ω, 68K	51B639144	Centralab PC-342

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA MOTOROLA PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	FM Ant. Trans.	25K640033						
L2	FM RF Coil	24K640031						
L3	FM Osc. Coil							
L4	1st FM IF Trans.	25K640034						
L5	Loopstick	24C639492 †						
L6	AM Osc. Coil	24B638340	14-1073	14-1073	BC-393	69-OSC.		
L7	2nd FM IF Trans.	24C638646	16-3487	16-3487	FM-254	1463		
L8	1st AM IF Trans.	24C634507	16-6758	16-6758	BC-352	12-C1	RF-1	
L9	3rd FM IF Trans.	24K638647						
L10	2nd AM IF Trans.	24K634508	16-6770	16-6770	BC-355	12-C6		
L11	Ratio Detector	24C638488	17-3498	17-3498	FM-255	1465		

† Includes Back Panel.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .32A	270 VCT @ .035A	6.3V @ 2.7A	25C638269						

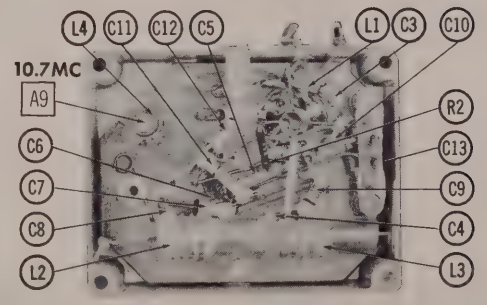
MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M1	Tuner	77D638430	(UT-343) FM, Complete
M2	Tuning Capacitor	19B638316	AM, 2 Gang (Ant. 28—352mmf, Osc. 24—140mmf)
M3	Switch	40C638431	Function Selector

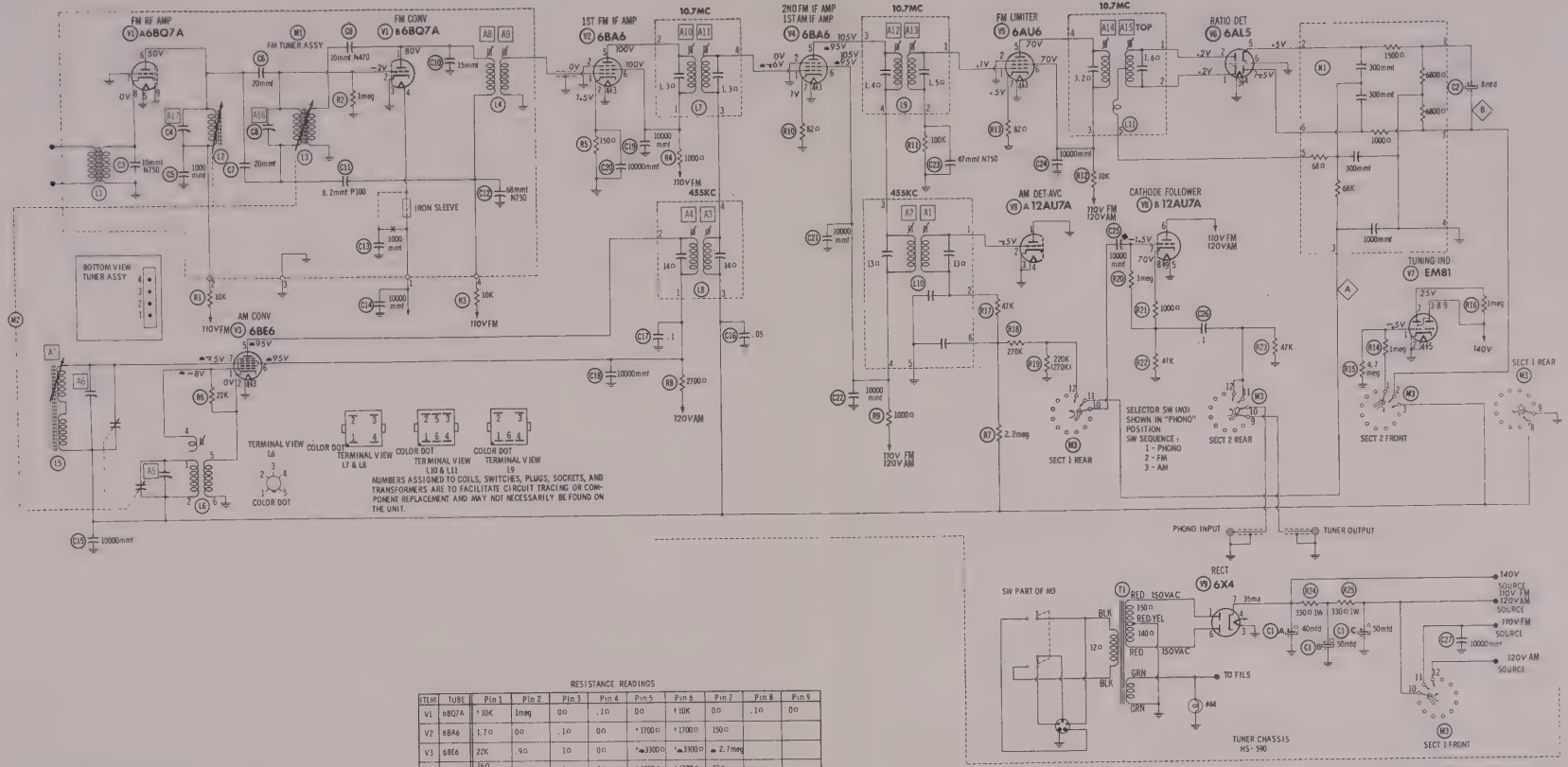
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)



FM RF SUB CHASSIS


FM RF AMP V1 6BQ7A
FM TUNER ASSY M1
FM CONV V1 6BQ7A
1ST FM IF AMP V2 6BA6
10.7MC
2ND FM IF AMP 1ST AM IF AMP V4 6BA6
FM LIMITER V5 6AU6
RATIO DET V6 6AL5
AM CONV V3 6BE6
AM DET-AVC V8 A 12AU7A
CATHODE FOLLOWER V8 B 12AU7A
TUNING IND V7 EM81
455KC
110V FM 120V AM
IRON SLEEVE
BOTTOM VIEW TUNER ASSY
TERMINAL VIEW L6
TERMINAL VIEW L7 & L8
TERMINAL VIEW L10 & L11
TERMINAL VIEW L9
COLOR DOT
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.
SELECTOR SW (M3) SHOWN IN "PHONO" POSITION
SW SEQUENCE :
1 - PHONO
2 - FM
3 - AM
SECT 1 REAR
SECT 2 REAR
SECT 2 FRONT
SECT 1 FRONT
PHONO INPUT
TUNER OUTPUT
RECT V9 6X4
SW PART OF M3
TO F1LS
TUNER CHASSIS HS-590
140V SOURCE
110V FM 120VAM SOURCE
110V FM SOURCE
120V AM SOURCE

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BQ7A	¶ 10K	1meg	0Ω	.1Ω	0Ω	† 10K	0Ω	.1Ω	0Ω
V2	6BA6	1.7Ω	0Ω	.1Ω	0Ω	¶ 1700Ω	† 1700Ω	150Ω		
V3	6BE6	22K	.9Ω	1Ω	0Ω	¶◓3300Ω	¶◓3300Ω	◓ 2.7meg		
V4	6BA6	16Ω ◓ 2.7meg	0Ω	1Ω	0Ω	¶ 1700Ω	¶ 1700Ω	82Ω		
V5	6AU6	100K	0Ω	.1Ω	0Ω	† 10K	† 10K	82Ω		
V6	6AL5	INF	INF	0Ω	.1Ω	8300Ω	0Ω	7800Ω		
V7	EM81	1meg ◓ 4.7meg	0Ω	† 0Ω	0Ω	.1Ω	NC	† 1meg	† 0Ω	† 0Ω
V8	12AU7A	0Ω	540K	0Ω	0Ω	0Ω	¶ 660Ω	1meg	68K	.1Ω
V9	6X4	150Ω	NC	0Ω	.1Ω	NC	140Ω	¶		

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT. ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
◓ MEASURED IN "AM" POSITION.
† MEASURED FROM PIN 7 OF V9.
◆ MEASURED FROM PIN 8 OF V8.
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of 15% in voltage and resistance readings.
6. No signal applied for voltage measurements.

⊛ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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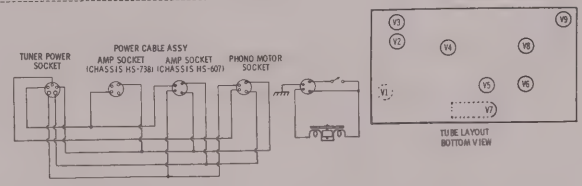
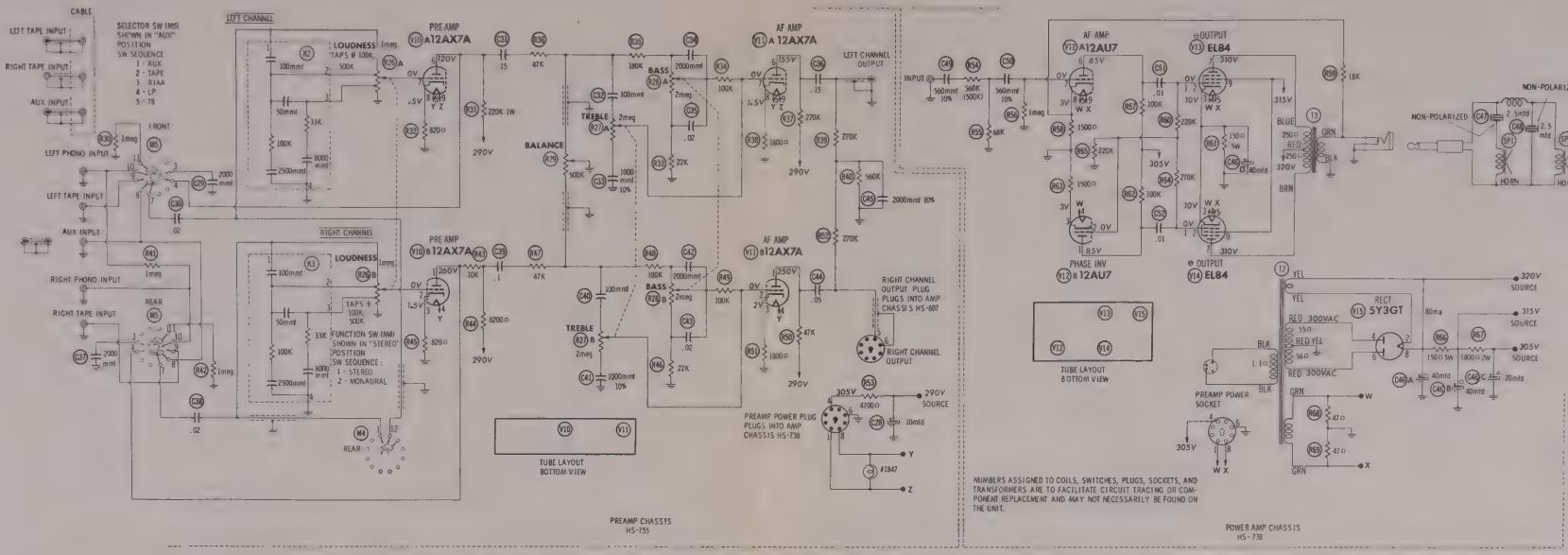


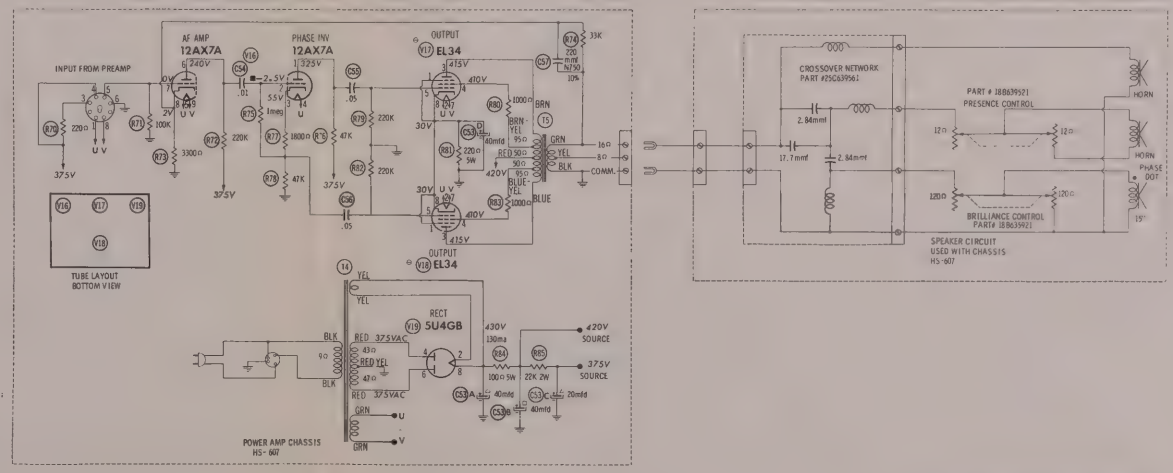
MOTOROLA MODELS SK25B, M, MC, MCH (Ch. HS-590, HS-607, HS-738, HS-755)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V10	12AX7A	†† 25K	0Ω	820Ω	27Ω	27Ω	†† 225K	0Ω	820Ω	27Ω
V11	12AX7A	†† 53K	120K	1800Ω	27Ω	27Ω	†† 225K	120K	1800Ω	27Ω
V12	12AU7	†† 100K	220K	1500Ω	27Ω	27Ω	† 100K	1meg	1500Ω	27Ω
V13	EL84	440K	440K	150Ω	27Ω	27Ω	NC	†† 250Ω	NC	†† 150Ω
V14	EL84	490K	490K	150Ω	27Ω	27Ω	NC	†† 250Ω	NC	†† 150Ω
V15	5Y3GT	NC	¶	TP	55Ω	TP	58Ω	NC	¶	
V16	12AX7A	● 69K	1meg	49K	INF	INF	● 240K	100K	3300Ω	INF
V17	EL34	220Ω	INF	●245Ω	■ 1100Ω	220K	TP	INF	220Ω	
V18	EL34	220Ω	INF	● 245Ω	■ 1100Ω	220K	TP	INF	220Ω	
V19	5U4GB	NC	¶	NC	43Ω	NC	47Ω	NC	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
● MEASURED FROM PIN 8 OF V16. NC NO CONNECTION.
■ MEASURED FROM PIN 3 OF V16. TP TIE POINT.



● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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MOTOROLA MODELS SK2SB, M, MC, MCH (Ch. HS-590, HS-607, HS-738, HS-755)

HS-755 PRE AMP PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V10	Left Channel Preamp. - Right Channel Preamp.	12AX7A	V11	Left Channel AF Amp. - Right Channel AF Amp.	12AX7A

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C28	10	400	23K642196	PRS1720	BR1045	TC72	TD-10-450	TVA-1705	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C29	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C30	.02 200V		P288N-02	DD-203	CUB2S2	4DP-2-203	GEM-412	2TM-S2
C31	.15 400V		P488N-15		CUB4P15	4DP-4-154	GEM-4015	4TM-P15
C32	100		BPD-0001	DD-101	L10T1	CCD-101	GP310	5GA-T10
C33	1000 10%		DI-1000	DD-102	PM6D1	CCD-102	GP210	10TS-D10
C34	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C35	.02 400V		P488N-02	DD-203	CUB4S2	4DP-2-203	GEM-412	4TM-S2
C36	.15 400V		P488N-15		CUB4P15	4DP-4-154	GEM-4015	4TM-P15
C37	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C38	.02 200V		P288N-02	DD-203	CUB2S2	4DP-2-203	GEM-412	2TM-S2
C39	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C40	100		BPD-0001	DD-101	L10T1	CCD-101	GP310	5GA-T10
C41	1000 10%		DI-1000	DD-102	PM6D1	CCD-102	GP210	10TS-D10
C42	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C43	.02 400V		P488N-02	DD-203	CUB4S2	4DP-2-203	GEM-412	4TM-S2
C44	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5
C45	2000 10%		DI-2000		PM6D2	CCD-202	GP220	10TS-D20

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R26A	1meg *	1/2	18K643897					Loudness, Left Channel
B	1meg *	1/2						Loudness, Right Channel
R27A	2meg	1/2	18A642217	B-76	AD47-2meg-S	Q13-139		Treble, Left Channel
B	2meg	1/2		SR-76	Not Req.	M13-139	■ UE1877	Treble, Right Channel
C	Shaft			Not Req.	FS-3	Not Req.		
R28A	2meg	1/2	18A642217	B-76	AD47-2meg-S	Q13-139		Bass, Left Channel
B	2meg	1/2		SR-76	Not Req.	M13-139	■ UE1877	Bass, Right Channel
C	Shaft			Not Req.	FS-3	Not Req.		
R29A	500K	1/2	18K643931	B-617	A47-500K-S	Q11-133	U46	Balance
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	

* Taps @ 100K, 500K

■ "STA-LOC" Equivalent: FA26A, RU26A, CS3500.

RESISTORS

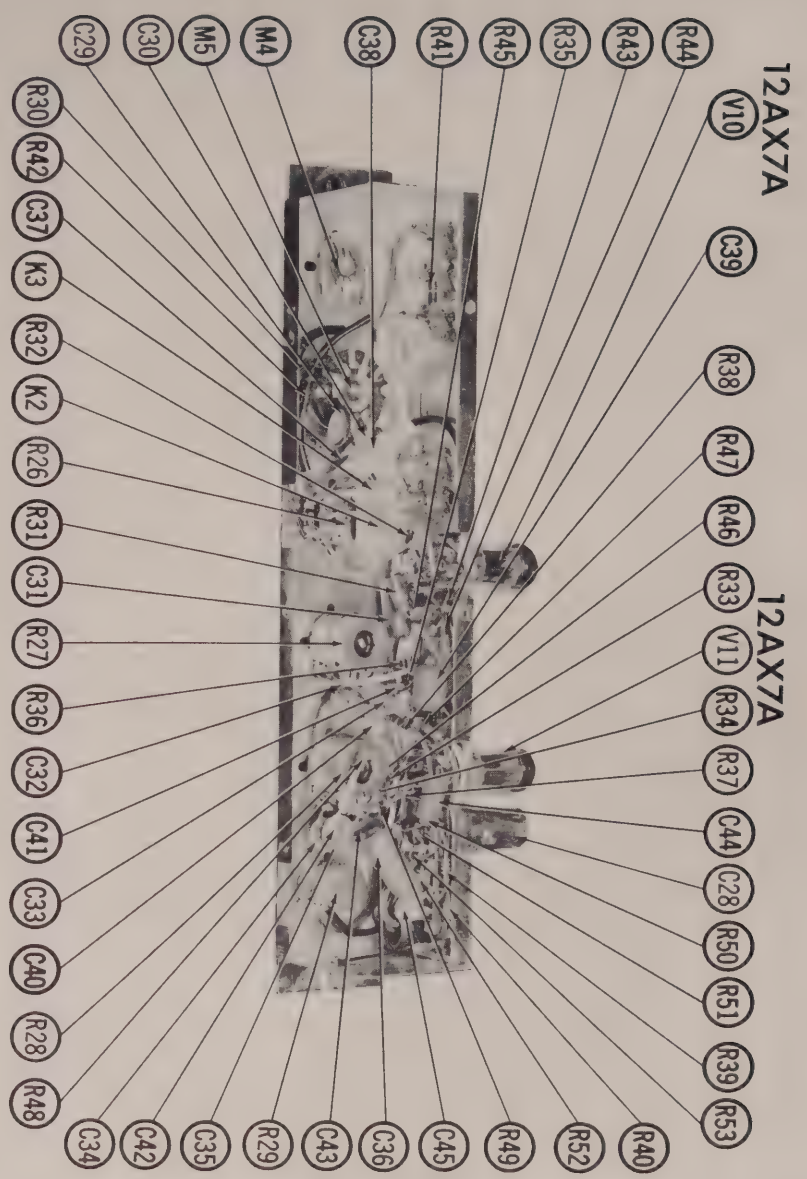
All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R30	1meg	
R31	220K 1W	
R32	820Ω	
R33	22K	
R34	100K	
R35	180K	
R36	47K	
R37	220K	

ITEM No.	RATING	REMARKS
R38	1800Ω	
R39	270K	
R40	560K	
R41	1meg	
R42	1meg	
R43	10K	
R44	8200Ω	
R45	820Ω	

ITEM No.	RATING	REMARKS
R46	22K	
R47	47K	
R48	180K	
R49	100K	
R50	47K	
R51	1800Ω	
R52	270K	
R53	4700Ω	

HS-755 PRE AMP CHASSIS



HS-755 PARTS LIST AND DESCRIPTIONS (Continued)

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	MOTOROLA PART No.	REPLACEMENT DATA
K2	Loudness Comp.	50mmf, 100mmf, 2500mmf, 8000mmf, 33K, 100K	51K643898	
K3	Loudness Comp.	50mmf, 100mmf, 2500mmf, 8000mmf, 33K, 100K	51K643898	

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M4	Switch	40B642153	Function Selector
M5	Switch	40K643932	Compensation

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

HS-738 LEFT CHANNEL AMP PARTS LIST

TUBES

ITEM No.	USE	TYPE
V12	Left Channel AF Amp. - Phase Inverter	12AU7
V13	Left Channel Output	EL84 (6BQ5) *

ITEM No.	USE	TYPE
V14	Left Channel Output	EL84 (6BQ5) *
V15	Rectifier	5Y3GT

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C46A	●40	400	23B632244	AFH4-79-10	D0663.2	FP430.6	TMQ-164	TVL-4739	
B	■40	400							
C	▲20	400							
D	40	25							
C47	2.5	20VNP	23K643971	NP-PRS7300	BBR5-50 †	TCN502		TVAS-1176 *	
C48	2.5	20VNP	23K643971	NP-PRS7300	BBR5-50 †	TCN502		TVAS-1176 *	

† Use 2 units. Connect negative terminals together.
Connect positive terminals into circuit the same as the original non-polarized unit.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

HS-738 LEFT CHANNEL AMP PARTS LIST (Continued)

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C49	560 10%		DI-560	DD-561	1R5T56	CCD-561	GP356	10TS-T56
C50	560 10%		DI-560	DD-561	1R5T56	CCD-561	GP356	10TS-T56
C51	.01 400V		P488N-01	DD-103	CUB4S1	4DP-1-103	GEM-411	4TM-S1
C52	.01 400V		P488N-01	DD-103	CUB4S1	4DP-1-103	GEM-411	4TM-S1

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R54	560K	(500K) *
R55	68K	
R56	1meg	
R57	100K	
R58	1500Ω	

ITEM No.	RATING	REMARKS
R59	18K	
R60	220K	
R61	150Ω 5W	
R62	100K	
R63	1500Ω	
R64	270K	

ITEM No.	RATING	REMARKS
R65	220K	
R66	150Ω 5W	
R67	1800Ω 2W	
R68	47Ω	
R69	47Ω	

* Alternate Value

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	RATING SEC. 4	RATING SEC. 5	REPLACEMENT DATA MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	117V ⓐ .66A	600 VCT ⓐ .080A	5V ⓐ 2A	6.3V ⓐ 2A			25C638551	22R04①			P-8175②	22R04①	

① Use Original Shields.
② Drill New Mounting Holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T3	5800Ω CT	16Ω	25K643933	24S43	A-3028		A-3880	24S43	S-57Z①	① Drill New Mounting Hole.

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA MOTOROLA PART No.	QUAM PART No.	NOTES
SP1	Horn	PM	15-17Ω	50C639472		
SP2	Horn	PM	15-17Ω	50C639473		

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

HS-607 RIGHT CHANNEL AMPLIFIER CHASSIS

HS-738 LEFT CHANNEL AMPLIFIER CHASSIS

HS-607 RIGHT CHANNEL PARTS LIST AND DESCRIPTIONS

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V16	Right Channel AF Amp. - Phase Inverter	12AX7A
V17	Right Channel Output	EL34 (6CA7) *

ITEM No.	USE	TYPE
V18	Right Channel Output	EL34 (6CA7) *
V19	Rectifier	5U4GB

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C53A	▲40	475	23B639395		D0185			TVLS-4814.1 *	
B	■40	450			BR505				
C	▲20	450							
D	40	50							

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C54	.01 400V		P488N-01	DD-103	CUB4S1	4DP-1-103	GEM-411	4TM-S1
C55	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5
C56	.05 400V		P488N-05	DD-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5
C57	220 N750 10%		N750-DI 220	DTN-220	C10T22U	CCTN-220	CN7-322	10TCU-T22

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R70	220Ω	
R71	100K	
R72	220K	
R73	3300Ω	
R74	33K	

ITEM No.	RATING	REMARKS
R75	1meg	
R76	47K	
R77	1800Ω	
R78	47K	
R79	220K	
R80	1000Ω	

ITEM No.	RATING	REMARKS
R81	220Ω 5W	
R82	220K	
R83	1000Ω	
R84	100Ω 5W	
R85	22K 2W	

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	RATING SEC. 4	RATING SEC. 5	REPLACEMENT DATA MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T4	117V ⓐ 1.1A	750 VCT ⓐ .130A	5V ⓐ 3A	6.3V ⓐ 4A			25C639391	22R33①			PC8411①	22R33①	R-18A①

① Drill New Mounting Holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T5	4100Ω CT With Screen Taps ⓐ 440Ω CT	16Ω Taps ⓐ 8Ω	25C639392							

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA MOTOROLA PART No.	QUAM PART No.	NOTES
	Horn	PM	15-17Ω	50C639472		
	Horn	PM	15-17Ω	50C639473		
	15"	PM	15-17Ω	50C639471		

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA MOTOROLA PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	REMARKS
M7	47K642898 † ♦	W-107STSS † or W-107STDS † ♦	S-69X † or S-69XSD † ♦ or S-69XDD ♦	† Jewel ♦ Diamond
	47K643152 † ① (78RPM) 47K643150 ♦ ① (LP)			① Alternate Part Number

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA MOTOROLA PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. NEEDLE	JENSEN PART No. CARTRIDGE	JENSEN PART No. NEEDLE	SONOTONE PART No. CARTRIDGE	SONOTONE PART No. NEEDLE
M6	59K642982 59K643335 ①	13TB		26	S1-1 S3-3			8TA4-S	N-8TA-S

① Alternate Part Number.

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Bezel	13K639880	Tuner
Knob	36K643912	Tuning
Knob	36K643365	Loudness
Knob	36C639495	Brilliance, Presence
Knob	36K643369	Balance
Knob	36K643367	Bass, Treble
Knob	36K643361	Function
Knob	36K643363	Compensator
Dial Scale	34C638680	Tuner
Dial Background	64B638274	Tuner
Pointer	1K638233	
Escutcheon	13D643339	
Door Handle	55K639224	

PHOTOFACT® Folder with CIRCUITRACE*

EIA MEMBER

MOTOROLA MODELS X12A, E (Ch. HS-732)

MOTOROLA MODELS
X12A, E (Ch. HS-732)

MODEL X12A

MOTOROLA MODELS
X12A, E (Ch. HS-732)

TRADE NAME	Motorola Models X12A, X12E (Ch. HS-732)
MANUFACTURER	Motorola Inc., 4545 W. Augusta Blvd., Chicago 51, Illinois
TYPE SET	Battery Operated Portable Transistorized AM Receiver
POWER SUPPLY	6 Volts DC
RATING	9MA@6 Volts DC(No Signal, Min. Volume) 20MA@6 Volts DC(Signal, Normal Volume)
TUNING RANGE—BROADCAST	535-1620KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools:

A1, A2, A3.....GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987
WALSCO #2531

A4, A5.....GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

A6.....GENERAL CEMENT #8282, 8606, 8606L, 9091
WALSCO #2526, 2541, 2543, 2544

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to antenna stator lug of tuning gang. Low side to chassis.	455KC (400∿ Mod.)	Tuning gang fully open.	Across black leads of speaker.	A1, A2, A3	Adjust for maximum output.
2.		Loop	1620KC	"	"	A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune to 1400KC Signal	"	A5	"
	The following steps are not necessary unless the oscillator core (A6) has been tampered with or associated components have been replaced. Preset A4 1/4 turn from its tight position before proceeding.						
4.		Loop	530KC	Tuning gang fully closed.	Across black leads of speaker.	A6	Adjust for maximum output. Repeat Steps 2 and 4 until oscillator covers required range. Make Step 2 last. Repeat Step 3.
5.		"	600KC	Tune to 600KC Signal	"	A6	Adjust for maximum output while rocking tuning gang.

DISASSEMBLY INSTRUCTIONS

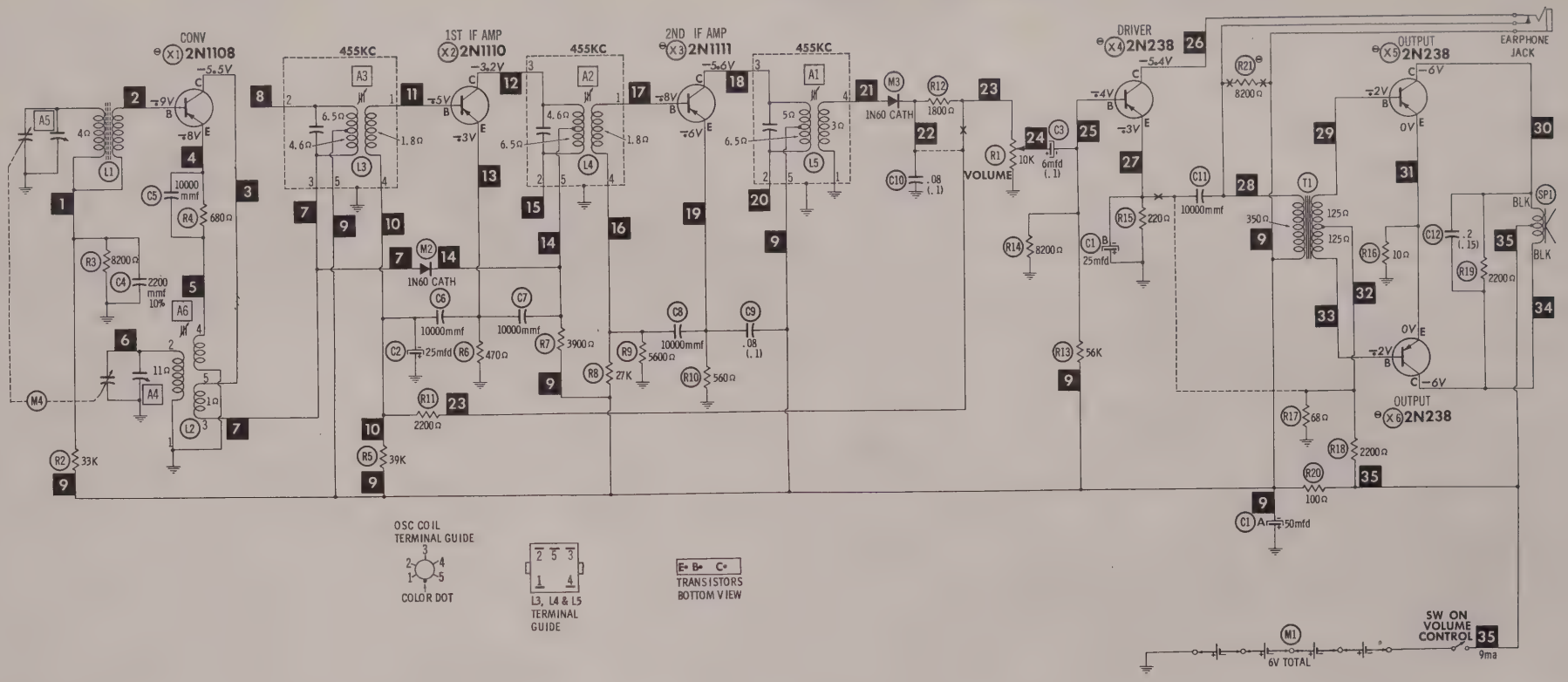
1. Insert coin into cabinet slot and twist. Remove cabinet back.
2. Remove nut and washer from earphone jack.
3. Remove battery holder and batteries.
4. Spread top and bottom center of cabinet until chassis clears side retainer tabs. Lift chassis at speaker end and slide over speaker until chassis clears retainer tabs at earphone jack end of cabinet.
5. Loosen speaker mounting screws and slide speaker free.
6. Lift chassis, speaker and battery holder from cabinet.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

JF465

SET 472 FOLDER 7



1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

RESISTANCE READINGS

ITEM	TYPE	BASE	EMITTER	COLLECTOR
X1	2N1108	7000Ω	680Ω	†105Ω
X2	2N1110	5000Ω	470Ω	†500Ω †■ 4000Ω
X3	2N1111	5000Ω	560Ω	†105Ω
X4	2N238	7500Ω	220Ω	†450Ω
X5	2N238	190Ω	10Ω	†7Ω
X6	2N238	190Ω	10Ω	†7Ω

TRANSISTORS REMOVED FOR RESISTANCE MEASUREMENTS.
† MEASURED FROM JUNCTION OF R18 AND R20.
■ REVERSE METER LEADS.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE®

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MOTOROLA MODELS X12A, E (Ch. HS-732)

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N1108①	Converter			2N486	2N412	PNP
X2	2N1110	1st IF Amplifier			2N483	2N409	PNP
X3	2N1111②	2nd IF Amplifier			2N483	2N409	PNP
X4	2N238③	Driver		2N407	2N362	2N407	PNP
X5	2N238④	Output		2N407	2N633	2N407	PNP } Matched
X6	2N238④	Output		2N407	2N633	2N407	PNP } Pair

① Part #48A124347. Alternate 2N1108 coded red Part #48A124348 used in Chassis coded-2.
② Part #48A124351. Alternate 2N1111 coded red Part #48A124352 used in Chassis coded-2.
③ Part #48A124353. Alternate 2N238 Part #48A124354 used in Chassis coded-2.
④ Part #48A124355. Alternate 2N238 Part #48A124354 used in Chassis coded-2.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	MOTOROLA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	50	10	23B639917	BCD10X5030		PET2365C		VL-2250	
B	25	10							
C2	25	3	23K637758	PWE3025	EC25-3	TT3X25	ML25-3	TE-1055	
C3	6	10	23K642111 ①	XPP6-15	NLW6-15	TT12X5	ML6-15	TE-1127.1	

① Some versions may use .1mfd in this application.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	2200 10%		DI-2200			CCS-222	GP222	10TS-D22
C5	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C6	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C7	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C8	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C9	.08 50V	(.1) *						2WFS82
C10	.08 50V	(.1) *						2WFS82
C11	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C12	.2 50V	(.15) *				IDP-3-204		

* Alternate Value

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	10K	1/4	18B640094					Volume & Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	33K	
R3	8200Ω	
R4	680Ω	
R5	39K	
R6	470Ω	
R7	3900Ω	
R8	27K	

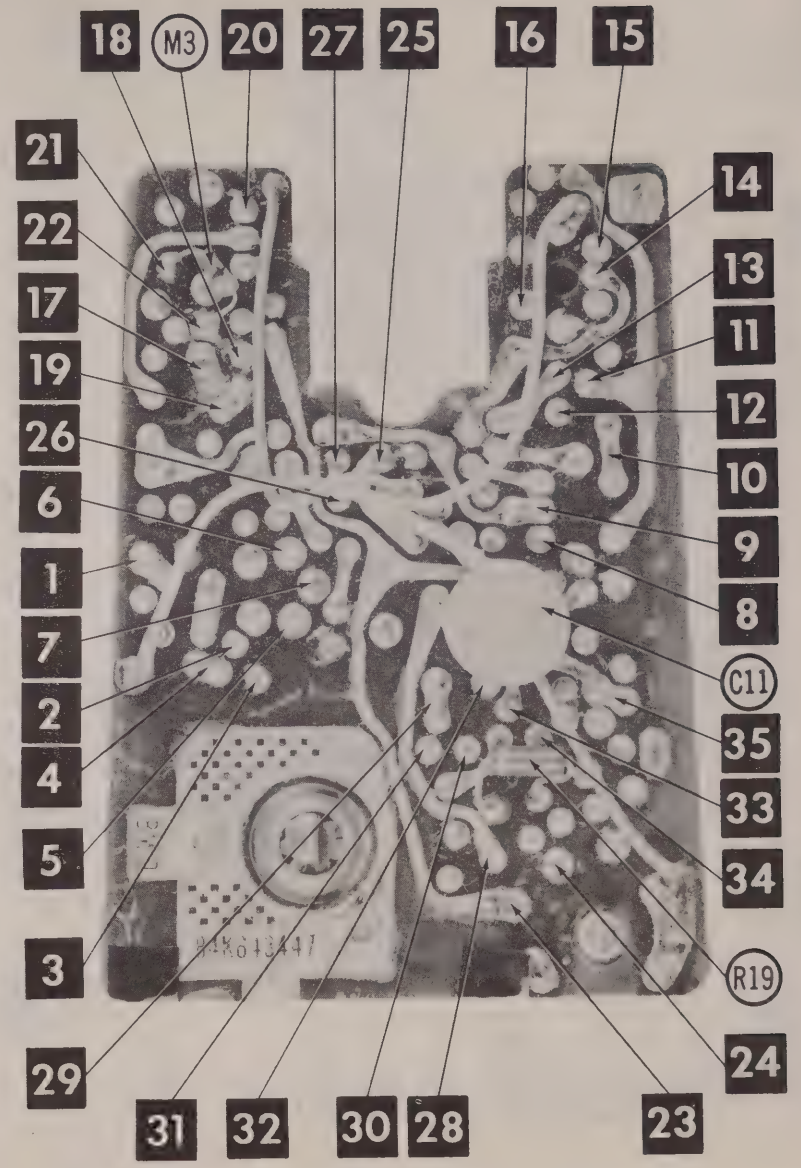
ITEM No.	RATING	REMARKS
R9	5600Ω	
R10	560Ω	
R11	2200Ω	
R12	1800Ω	
R13	56K	
R14	8200Ω	
R15	220Ω	

ITEM No.	RATING	REMARKS
R16	10Ω	
R17	68Ω	
R18	2200Ω	
R19	2200Ω	
R20	100Ω	
R21	8200Ω	Note 1

Note 1. Not used in some versions.

PRINTED BOARD

A Howard W. Sams CIRCUITRACE* Photo



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		MOTOROLA PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	24K643975						
L2	Osc. Coil	24K643917						
L3	1st IF Trans.	24C643727						
L4	2nd IF Trans.	24C643727						
L5	3rd IF Trans.	24K643729						

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	MOTOROLA PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	1	1	25K640349						

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	QUAM PART No.	
SP1	2 3/4"		230Ω CT	50B639916		Magnetic Type Speaker

BATTERIES

ITEM No.	VOLTAGE	MOTOROLA PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	1.5V			930		1015		M15	4 Required

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		MOTOROLA PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M2	1N60	48K640754	1N60	1N60	1N60	Overload & AVC (Pigtail)
M3	1N60	48K640754	1N60	1N60	1N60	Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M4	Tuning Cap	19B643442	2 Gang (Ant. 8—130mmf, Osc. 15— 94mmf)
	Printed Board	84K643447	

CABINETS & CABINET PARTS

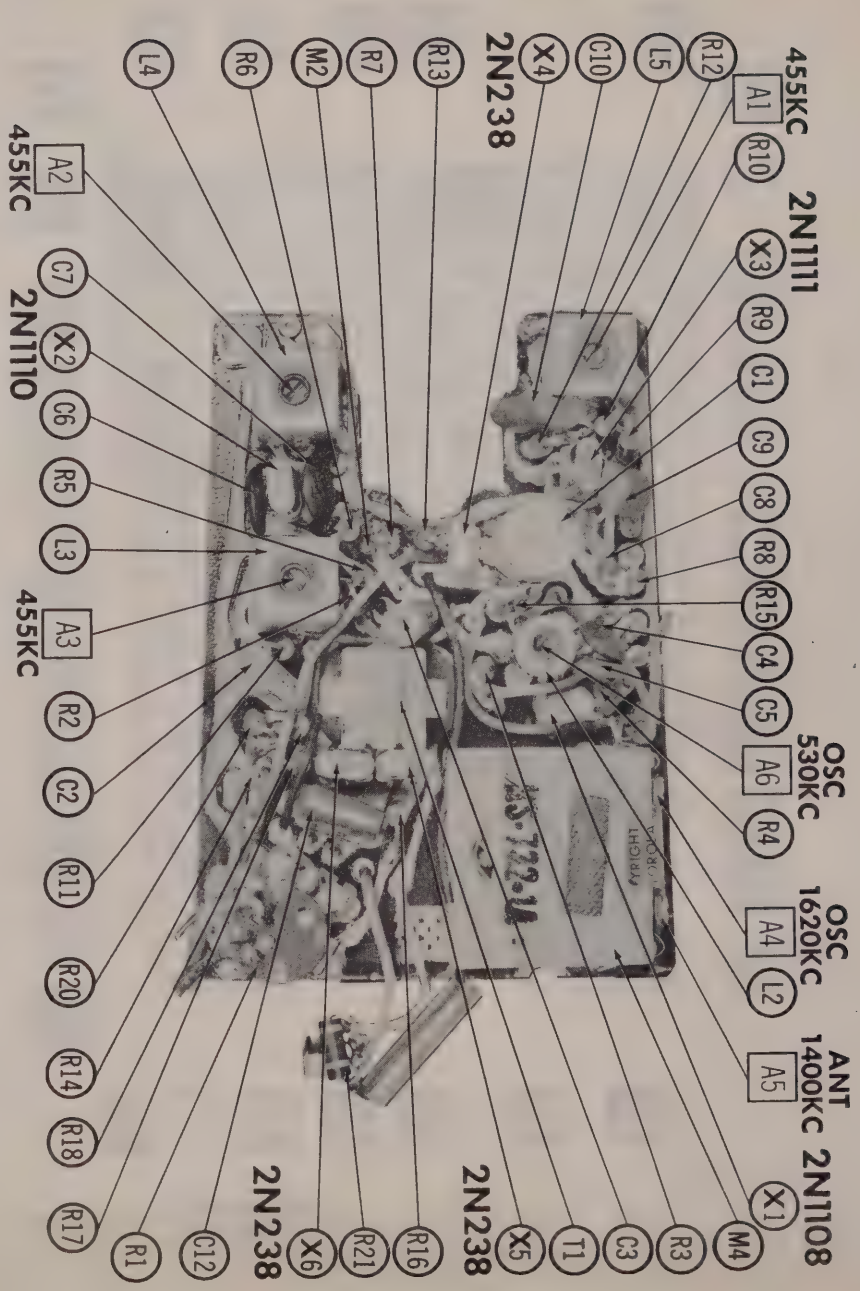
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	36C643395	Tuning
Knob	36B643396	Volume
Cabinet Back	1V643454	Model X12A
Cabinet Back	1V643455	Model X12E
Cabinet Front	1V644555	Model X12A (Includes Medallion)
Cabinet Front	1V644556	Model X12E (Includes Medallion)
Escutcheon	1V644554	Includes Tuning Lens

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

CHASSIS—TOP VIEW



PHOTOFACT* Folder

OLYMPIC MODELS
695, 696, 697, 700

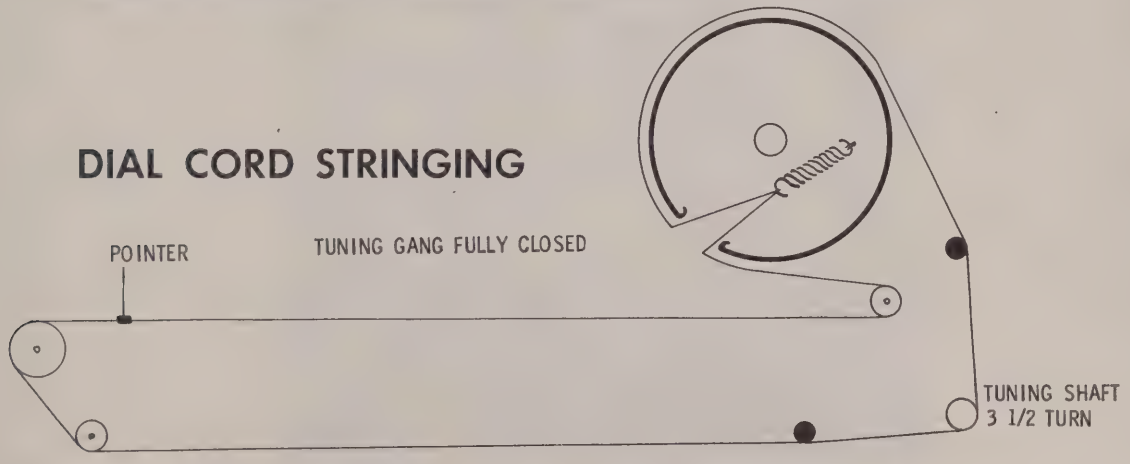
MODEL 697

OLYMPIC MODELS
695, 696, 697, 700

TRADE NAME	Olympic Models 695, 696, 697, 700		
MANUFACTURER	Olympic Radio & Tel. Inc., 34-01 38th Ave., Long Island City 1, N. Y.		
TYPE SET	AC Operated 12 Tube FM-AM Receiver With 4 Speed Automatic Record Changer (Stereo)		
POWER SUPPLY	105 – 120 Volts AC, 60 Cycles	RATING	86 Watts, .82 Amp. @117 Volts AC
TUNING RANGE—BROADCAST	535 – 1700KC	FREQ. MOD.	88-108MC

FOR SERVICE INFORMATION ON RECORD CHANGER PART #RX25908-1 – SEE SIMILAR V-M 1200A – PHOTOFACT SET 353 FOLDER 16 OR RECORD CHANGER MANUAL RC-10

DIAL CORD STRINGING



HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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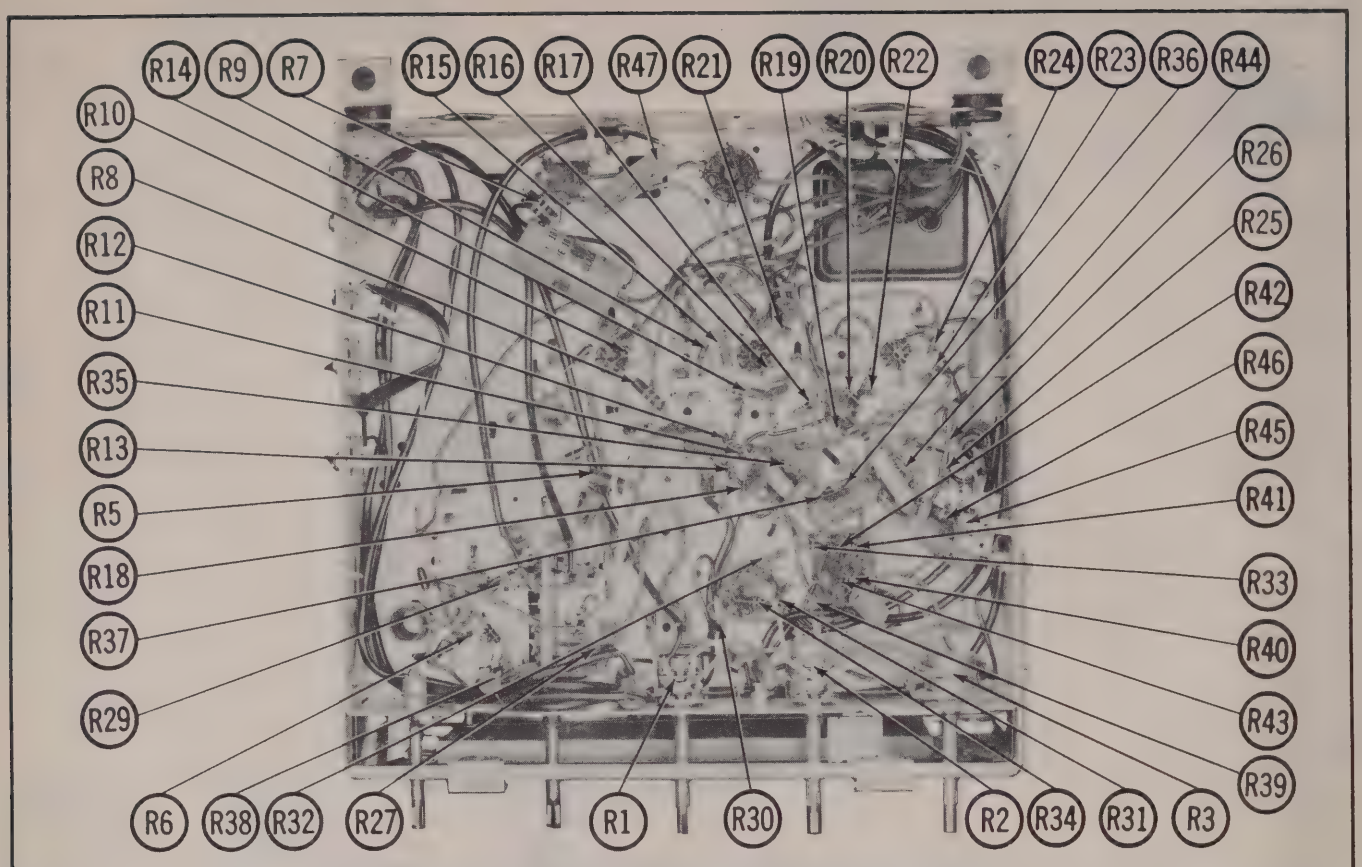
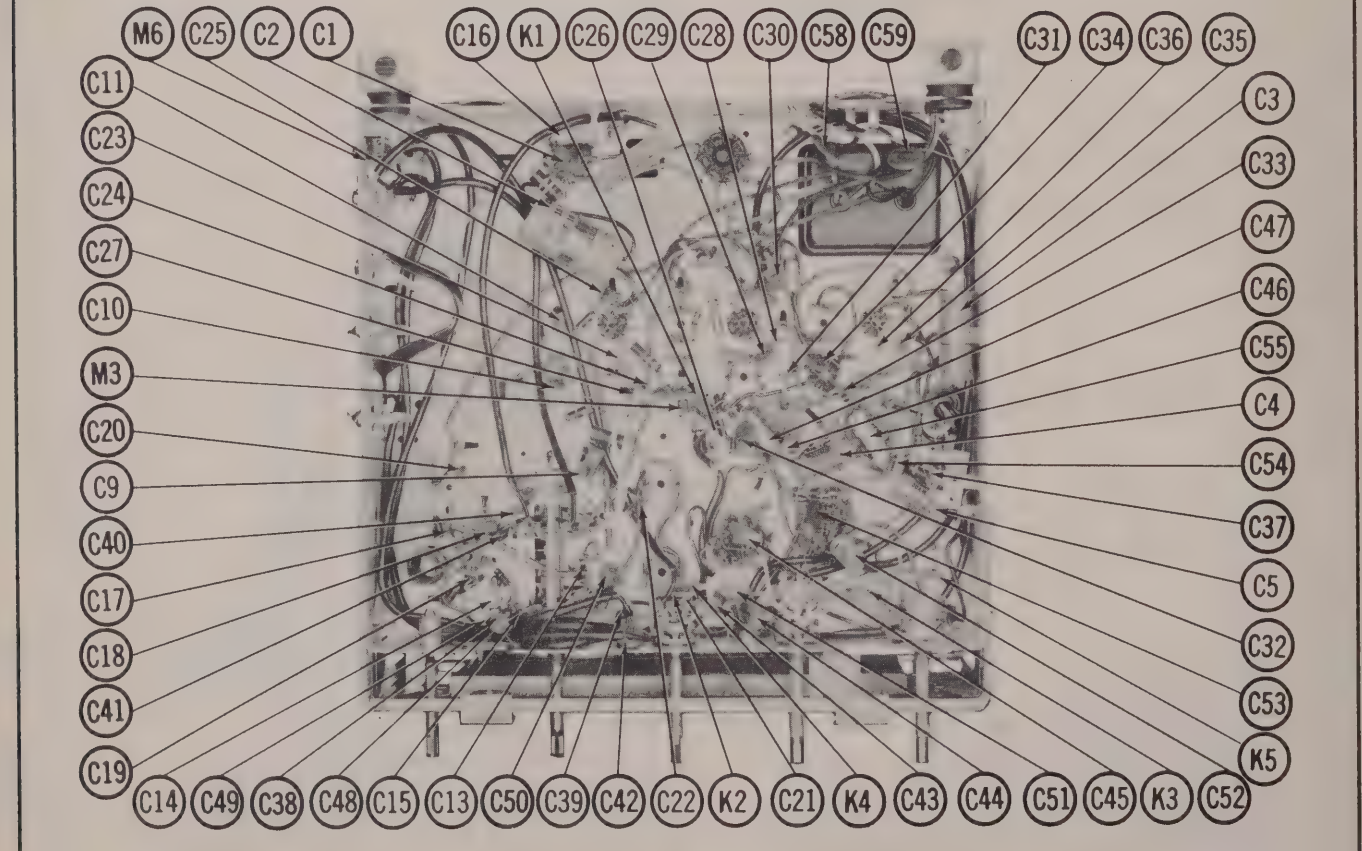
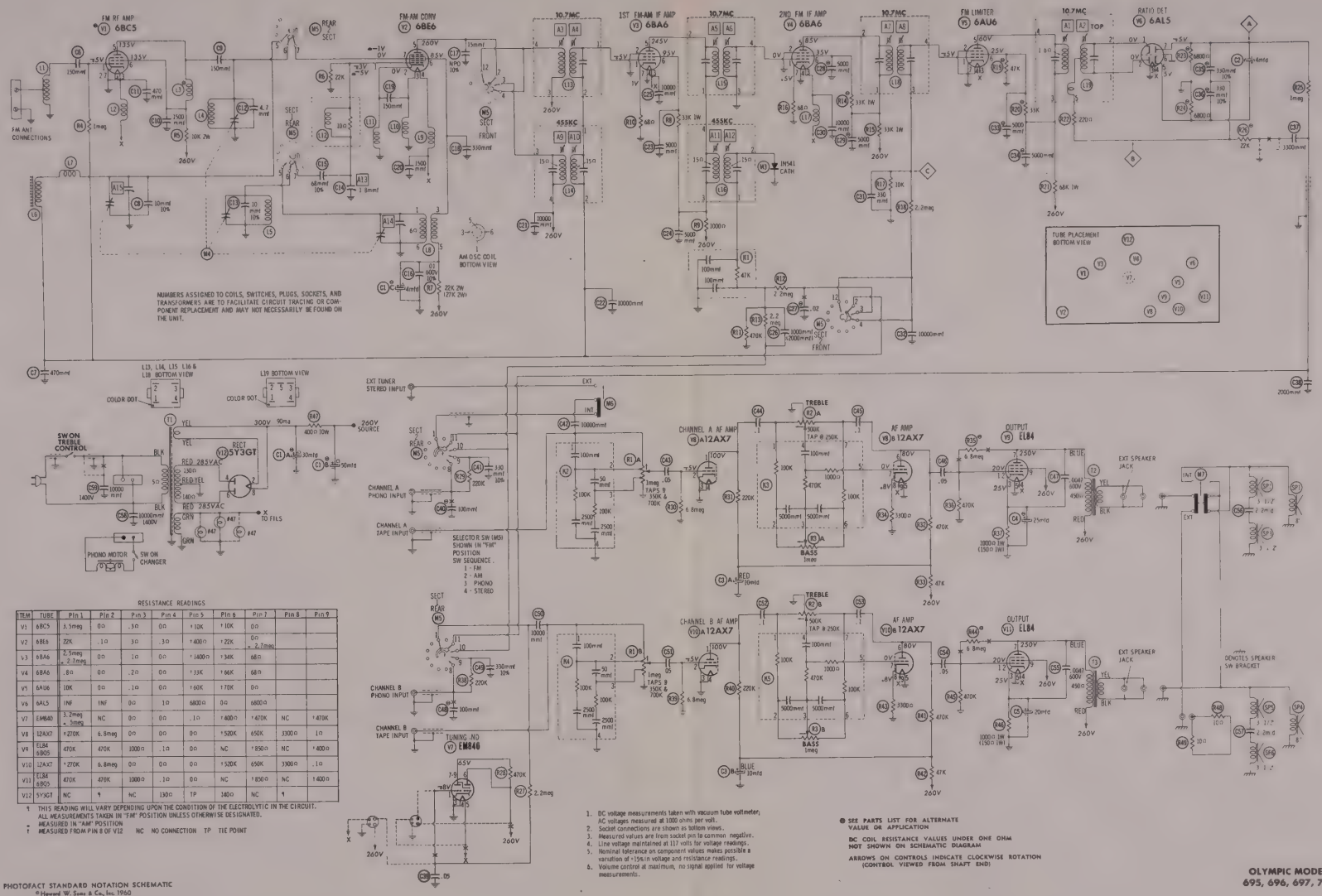


CHASSIS BOTTOM VIEW - RESISTOR IDENT.



CHASSIS BOTTOM VIEW - CAPACITOR & MISC. IDENT.



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BC5	3.5meg	0Ω	3Ω	0Ω	†10K	†10K	0Ω		
V2	6BE6	22K	1Ω	3Ω	3Ω	†400Ω	†22K	0Ω • 2.7meg		
V3	6BA6	2.5meg • 2.7meg	0Ω	1Ω	0Ω	†1400Ω	†34K	68Ω		
V4	6BA6	.8Ω	0Ω	2Ω	0Ω	†33K	†66K	68Ω		
V5	6AU6	10K	0Ω	1Ω	0Ω	†60K	†70K	0Ω		
V6	6AL5	INF	INF	0Ω	1Ω	6800Ω	0Ω	6600Ω		
V7	EM840	3.2meg • 3meg	NC	0Ω	0Ω	1Ω	†400Ω	†470K	NC	†470K
V8	12AX7	†270K	6.8meg	0Ω	0Ω	0Ω	†520K	650K	3300Ω	1Ω
V9	EL84 6BQ5	470K	470K	1000Ω	1Ω	0Ω	NC	†850Ω	NC	†400Ω
V10	12AX7	†270K	6.8meg	0Ω	0Ω	0Ω	†520K	650K	3300Ω	1Ω
V11	EL84 6BQ5	470K	470K	1000Ω	1Ω	0Ω	NC	†850Ω	NC	†400Ω
V12	5Y3GT	NC	¶	NC	130Ω	TP	140Ω	NC	¶	

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.
- MEASURED IN "AM" POSITION
† MEASURED FROM PIN 8 OF V12 NC NO CONNECTION TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC
©Howard W. Sams & Co., Inc. 1960

OLYMPIC MODELS
695, 696, 697, 700

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.
To set pointer, turn tuning capacitor fully closed and set pointer parallel with base of dial.
Suggested alignment tools:
A1 thru A8..... GENERAL CEMENT #8606, 8606L, 8282, 9295
WALSCO #2526, 2543, 2544, 2545
A9 thru A12..... GENERAL CEMENT #5097, 8727
WALSCO #2515
A13..... GENERAL CEMENT #8721, 8722
WALSCO #2519
A14, A15..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.001mfd	High side to pin 1 (grid) of FM Limiter. Low side to chassis.	10.7MC (Unmod.)	FM	Tuning gang fully open	DC probe thru 10K to point Ⓐ. Common to chassis.	A1	Adjust for maximum deflection.
2.	"	"	"	"	"	DC probe to point Ⓑ. Common to chassis.	A2	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
3.		Two turns of wire looped around Converter tube.	"	"	"	DC probe thru 10K to point Ⓒ. Common to chassis.	A3, A4, A5, A6, A7, A8	Adjust for maximum deflection.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
1.	.001mfd	High side to pin 1 (grid) of FM Limiter. Low side to chassis.	10.7MC (450 KC Swp)	FM	Tuning gang fully open	Vert. amp. thru 10K to point Ⓐ. Low side to chassis.	A1	Disconnect stabilizing capacitor C2. Adjust for maximum gain and symmetry of response similar to Fig. 1 with marker as shown.
2.	"	"	"	"	"	Vert. amp. to point Ⓑ. Low side to chassis.	A2	Reconnect C2. Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A1 for maximum amplitude and straightness of crossover lines.
3.		Two turns of wire looped around Converter tube.	"	"	"	Vert. amp. thru 10K to point Ⓐ. Low side to chassis.	A3, A4, A5, A6, A7, A8	Disconnect C2. Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. Reconnect C2.

AM IF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
4.	.1mfd	High side to RF Stator lug of tuning gang. Low side to chassis.	455KC (400∿ Mod.)	AM	Tuning gang fully open	Across voice coil	A9, A10, A11, A12	Adjust for maximum output.

FM RF ALIGNMENT

Coils not containing adjustable cores are adjusted by expanding or compressing coil turns.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
5	Two 150Ω Carbon Resistors	Across FM antenna terminals with 150Ω in each lead.	88MC (400∿ FM)	FM	88MC	Across voice Coil	L5	Adjust for maximum output.
6.	"	"	108MC	"	108MC	"	A13	Adjust for maximum output. Repeat Steps 5 & 6 until oscillator covers entire range.
7.	"	"	98MC	"	98MC	"	L1, L4	Adjust for maximum output.

AM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
8.		Loop	1500KC (400∿ Mod.)	AM	1500KC	Across voice coil	A14, A15	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
9.		"	600KC	"	600KC Signal	"		Check for tracking

FIG. 1

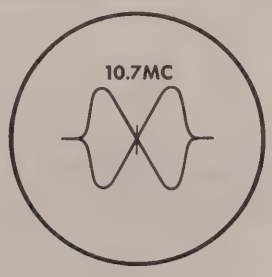
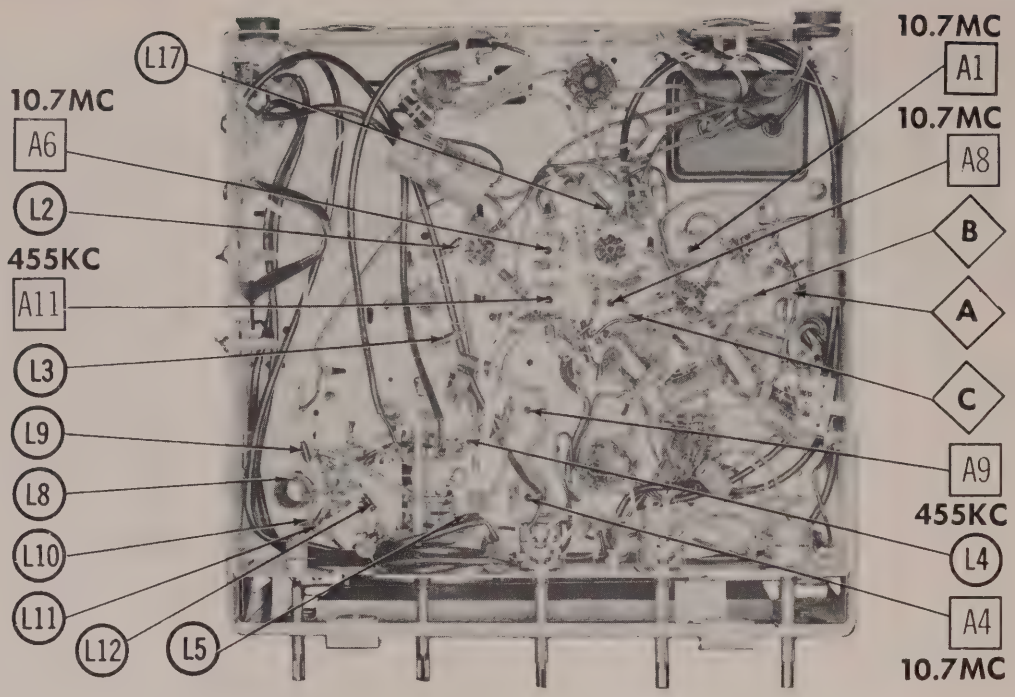
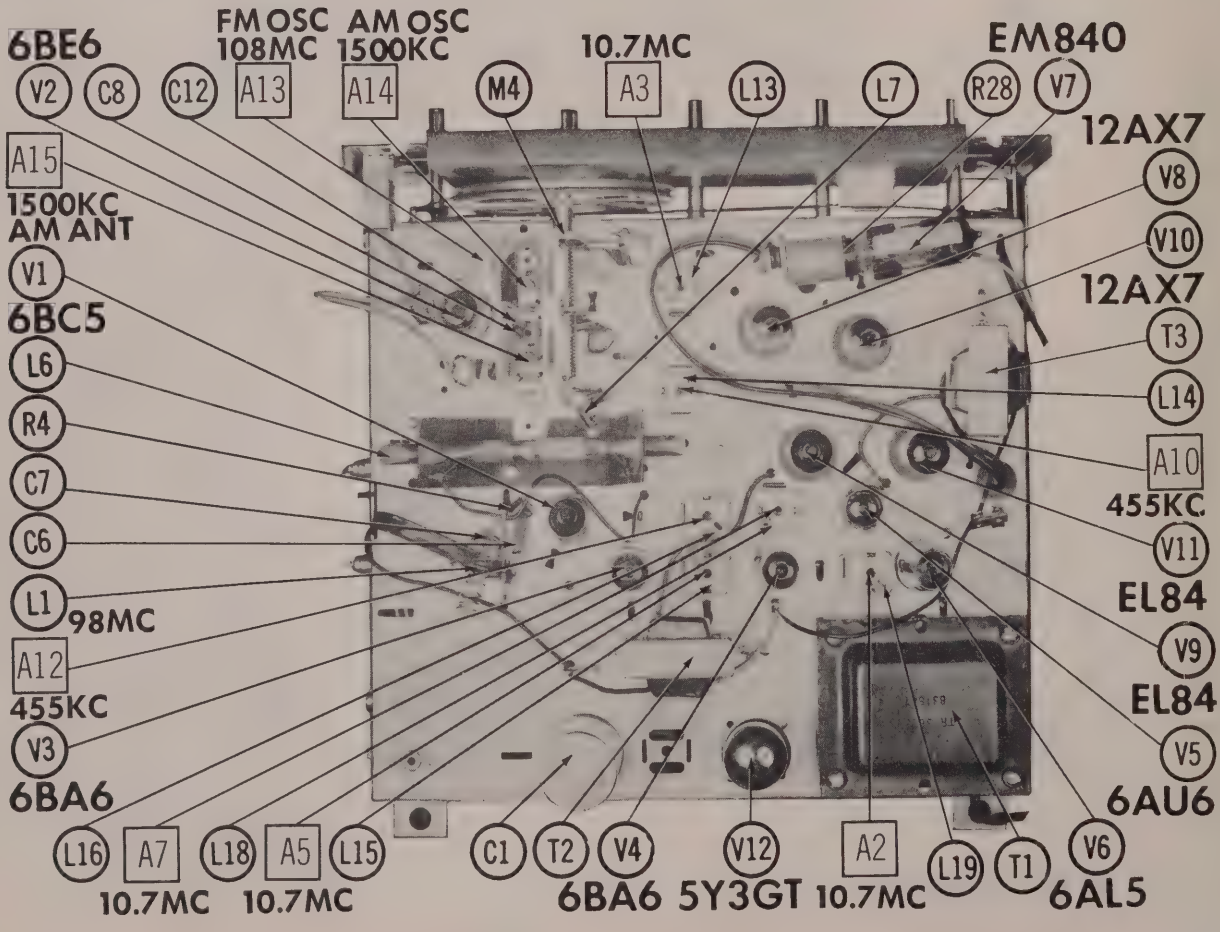


FIG. 2



CHASSIS BOTTOM VIEW - ALIGN. & INDUCTOR IDENT.



CHASSIS - TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V1	FM RF Amplifier	6BC5 (6AG5) *
V2	FM-AM Converter	6BE6
V3	1st FM-AM IF Amplifier	6BA6
V4	FM IF Amplifier	6BA6
V5	FM Limiter	6AU6
V6	Ratio Detector	6AL5

ITEM No.	USE	TYPE
V7	Tuning Indicator	EM840
V8	Channel A AF Amplifier	12AX7
V9	Channel A Output	EL84/6BQ5
V10	Channel B AF Amplifier	12AX7
V11	Channel B Output	EL84/6BQ5
V12	Rectifier	5Y3GT

* Alternate

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA OLYMPIC PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲30	400	CO2350	AFH3-45-10	C0290	FP333.88	TMT-123	TVLS-3694 *	Note 1
B	■50	400			BR445		TD-4-450		
C	▲4	400							
C2	4	450	CO1056	PRS1710	BR445	TC70	TD-4-450	TVA-1702	
C3A	10	400	CO5340	PRS2360	BBRD1145	TCD72	TDLD-26	TVA-2722	
B	10	400							
C4	25	25		PRS1260	BBR25-25	TC26	TD-25-25	TVA-1205	Note 2
C5	20	25	CO4651	SRE25V20	BBR10-25	TT25X20	ML20-25	TE-1206	

Note 1. Some versions may use 50/100/10mfd@400V in this application (Part #CO26186).
Note 2. Some versions may use 20mfd@25V in this application (Part #CO4651).

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C6	150		1468-00015	TCZ-150	5W5T15	CM-20B-151M	MC-236	MS-315
C7	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	5GA-T47
C8	10 10%		DI-10	DD-100	L10Q1	CCD-100	CNO-410	10TS-Q10
C9	150		1468-00015	TCZ-150	5W5T15	CM-20B-151M	MC-236	MS-315
C10	1500		BPD-0015	DD-152	BYA10D15	CCD-152	B-215	5HK-D15
C11	470		BPD-00047	DD-471	BYA10T47	CCD-471	B-347	5GA-T47
C12	4.7		NPO-SI 4.7	TCZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TS-V47
C13	10 10%		DI-10	DD-100	L10Q1	CCD-100	CNO-10	10TS-Q10
C14	1-8			829-10				
C15	68 10%		1469-000068	TCZ-68	5W5Q68	CM-20B-680K	CNO-468	MS-468
C16	.01 600V 10%		V84C6S1	D6-103	PM6S1	6DP-2-103	GTM-611	6TM-S1
C17	15 NPO 10%		NPO-DI 15	DTZ-15	C10Q15C	CCTO-150	CNO-415	10TCC-Q15
C18	330		1468-00033	D6-331	5W5T33	CM-20B-331M	JL-333	MS-333
C19	150		BPD-00015	DD-151	L10T15	CCD-151	B-315	5GA-T15
C20	1500		BPD-0015	DD-152	BYA10D15	CCD-152	B-215	5HK-D15
C21	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C22	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C23	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C24	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C25	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C26	1000	(2000mmf)	BPD-001	DD-102	BYA10D1M	CCD-102	B-210	5HK-D1
C27	.02 400V	①	P488N-02	DD-203	CUB4S2	4DP-2-203	GEM-412	4TM-S20
C28	5000	②	BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C29	5000	②	BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C30	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C31	330		BPD-00033	DD-331	L10T33	CCD-331	B-333	5GA-T33
C32	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C33	5000	②	BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C34	5000	②	BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C35	330 10%	③	DI-330	D6-331	L10T33	CCD-331	JL-333	MS-333
C36	330 10%	③	DI-330	D6-331	L10T33	CCD-331	JL-333	MS-333
C37	3300		BPD-0033	DD-332	BYA10D33	CCD-332	B-233	5HK-D33
C38	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C39	.05 50V		P288N-05	DF-503	CUB2S5	1DP-2-503	GEM-415	2TM-S5
C40	100	①	BPD-0001	DD-101	L10T1	CCD-101	UC-531	5GA-T10
C41	330 10%		DI-330	D6-331	L10T33	CCD-331	JL-333	MS-333
C42	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C43	.05 50V		P288N-05	DF-503	CUB2S5	1DP-2-503	GEM-415	2TM-S5
C44	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C45	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C46	.05 400V		P488N-05	DF-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5
C47	.0047 600V		P688N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C48	100	①	BPD-0001	DD-101	L10T1	CCD-101	UC-531	5GA-T10
C49	330 10%		DI-330	D6-331	L10T33	CCD-331	JL-331	MS-333
C50	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C51	.05 50V		P288N-05	DF-503	CUB2S5	1DP-2-503	GEM-415	2TM-S5
C52	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C53	.1 400V		P488N-1	DF-104	CUB4P1	4DP-3-104	GEM-401	4TM-P1
C54	.05 400V		P488N-05	DF-503	CUB4S5	4DP-3-503	GEM-415	4TM-S5
C55	.0047 600V		P688N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C56	2.2mfd 3V			UK-225				
C57	2.2mfd 3V			UK-225				
C58	10000 1400V		DAC-27	DF16-103	HVE16S1	16DP-3-103	2HV-110	20HKB-S1
C59	10000 1400V		DAC-27	DF16-103	HVE16S1	16DP-3-103	2HV-110	20HKB-S1

① Not used in some versions.
② Some versions may use a Component Combination in this application (Part #PC25417).
③ Some versions may use a Component Combination in this application (Part #PC25504).

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA OLYMPIC PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg *	1/2	PT25963				UE1726	Loudness Channel A
B	1meg *	1/2					Not Req.	Loudness Channel B
R2A	500K †	1/2	PT25961				UE1727-S	Treble Channel A
B	500K †	1/2					Not Req.	Treble Channel B
C	Switch						Not Req.	Power Off-On
R3A	1meg	1/2	PT25962				UE1728	Bass Channel A
B	1meg	1/2					Not Req.	Bass Channel B

* Taps@350K & 700K.
† Tap@250K.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	1meg	
R5	10K 2W	
R6	22K	
R7	22K 2W	(27K 2W) *
R8	33K 1W	
R9	1000Ω	
R10	68Ω	
R11	470K	
R12	2.2meg	
R13	2.2meg	
R14	33K 1W	Note 1
R15	33K 1W	
R16	68Ω	
R17	10K	
R18	2.2meg	
R19	47K	Note 1

ITEM No.	RATING	REMARKS
R20	33K	Note 1
R21	68K 1W	
R22	220Ω	
R23	6800Ω	Note 2
R24	6800Ω	Note 2
R25	1meg	
R26	22K	Note 2
R27	2.2meg	
R28	470K	
R29	220K	
R30	6.8meg	
R31	220K	
R32	470K	
R33	47K	
R34	3300Ω	
R35	6.8meg	Note 3

ITEM No.	RATING	REMARKS
R36	470K	
R37	1000Ω 1W	(150Ω 1W)*
R38	220K	
R39	6.8meg	
R40	220K	
R41	470K	
R42	47K	
R43	3300Ω	
R44	6.8meg	Note 3
R45	470K	
R46	1000Ω 1W	(150Ω 1W) *
R47	400Ω 10W	
R48	10Ω	
R49	10Ω	

Note 1. Some versions may use Component Combination in this application (Part #PC25417).
Note 2. Some versions may use Component Combination in this application (Part #PC25504).
Note 3. Not used in some versions.
* Alternate value.

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		OLYMPIC PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	FM Ant. Coil	CL2178						
L2	Fil. Choke	CK2445	19-1002	19-1002	BC-563	4606		2.2uh
L3	RF Choke	CK5742						3.3uh ①
L4	FM RF Coil	CL2179						
L5	FM Osc. Coil	CL2179						
L6	Loopstick	LP5506						
L7	RF Choke	CK2445	19-1002	19-1002	BC-563	4606		2.2uh
L8	AM Osc. Coil	CL1466			BC-397 *	5480-C *		
L9	Fil. Choke	CK2445	19-1002	19-1002	BC-563	4606		2.2uh
L10	Fil. Choke	CK2445	19-1002	19-1002	BC-563	4606		2.2uh
L11	Cathode Choke	CK2447	19-2005	19-2005		4588		.47uh ②
L12	RF Choke							
L13	1st FM IF Trans.	TR2180	16-3487	16-3487	FM-254	1463		
L14	1st AM IF Trans.	TRI644	16-6758	16-6758	BC-352	12-C1	RF-1	
L15	2nd FM IF Trans.	TRI643	16-3487	16-3487	FM-254	1463		
L16	2nd AM IF Trans.	TRI644	16-6758	16-6758	BC-353	12-C2	RF-2	
L17	Fil. Choke	CK2445	19-1002	19-1002	BC-563	4606		2.2uh
L18	3rd FM IF Trans.	TRI643	16-3487	16-3487	FM-254	1463		
L19	Ratio Detector	TRI646	17-3498	17-3498	FM-255	1465		

① Some versions may use alternate Part #CK5344.
② Two turns #20 wire on 10Ω Resistor.
* Drill mounting Hole.

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	OLYMPIC PART No.	REPLACEMENT DATA	
K1	Diode RF Filter	100mmf, 100mmf, 47K	PC2478-1	Aerovox Centralab Cornell-Dubilier Sprague	PA-97 PC-50 1ITM1 D-1
K2	Channel A Loudness Comp	50mmf, 100mmf, 2500mmf, 2500mmf, 100K, 100K	PC25420	Centralab	PC-325
K3	Channel A Tone Comp.	100mmf, 5000mmf, 5000mmf, 1000Ω, 100K, 100K, 470K	PC5648	Centralab Sprague	PC-190 TC-1
K4	Channel B Loudness Comp	50mmf, 100mmf, 2500mmf, 2500mmf, 100K, 100K	PC25420		
K5	Channel B Tone Comp.	100mmf, 5000mmf, 5000mmf, 1000Ω, 100K, 100K, 470K	PC5648	Centralab Sprague	PC-190 TC-1

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	OLYMPIC PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V@ .82A	570 VCT @.090A	5V@ 2A	TR-3666-1	22R05			PM8405	22R05	R-12B
	SEC. 3	SEC. 4	SEC. 5							
	6.3V@ 4.2A									

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	OLYMPIC PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	5300Ω	6-8Ω	TR25922	24S64	A-2901	AU-604	A-3823	24S64	S-53X	
T3	5300Ω	6-8Ω	TR25922	24S64	A-2901	AU-604	A-3823	24S64	S-53X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	OLYMPIC PART No.	QUAM PART No.	
SP1	8"	PM	3-4Ω	SK1906	8A31	
SP2	3½"	PM	3-4Ω	SK25463	3A15T	
SP3	3½"	PM	3-4Ω	SK4076-2	3A15T	
SP4	8"	PM	3-4Ω	SK1906	8A31	
SP5	3½"	PM	3-4Ω	SK25463	3A15T	
SP6	3½"	PM	3-4Ω	SK4076-2	3A15T	

PHONO CARTRIDGE

ITEM No.	OLYMPIC PART No.	REPLACEMENT DATA							
		ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M1		13-TB *	Not Req.	66 †	Not Req.			8T-S *	Not Req.

* Includes Mounting.
† Use Mount PT-3.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	OLYMPIC PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	
M2		W-101STS or W-102S	S69X * or S69XSD †♦ or S69XDD ♦	† Jewel ♦ Diamond * Metal

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		OLYMPIC PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M3	Clevite 650	1N541	1N60	1N60	1N295	AM Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	OLYMPIC PART No.	NOTES
M4	Tuning Cap.	CU5891	2 Gang (Ant. 24—540mmf, Osc. 21—187mmf)
M5	Switch	SW25964	Selector
M6	Switch	SW-2966-1	Stereo (EXT-INT.) (DPDT, Slide Type)
M7	Switch	SW-2966-1	Speaker (EXT-INT.) (DPDT, Slide Type)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	KN25954	Tuning
Knob	KN25955	Selector
Knob	KN25956	Rear Control
Knob	KN25957	Front Control
Pointer	PO25782	
Dial Glass	DL25780	
Cabinet	CA-25990	Model 696
Cabinet	CA-26103	Model 697

WIRING DATA

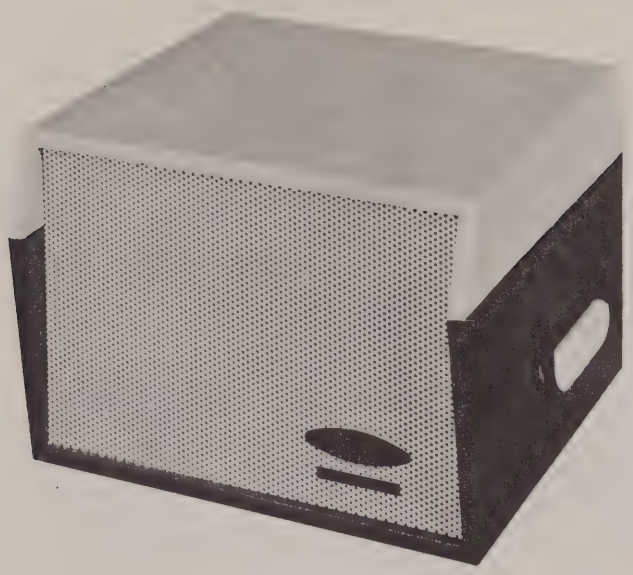
General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting) .....Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT® Folder

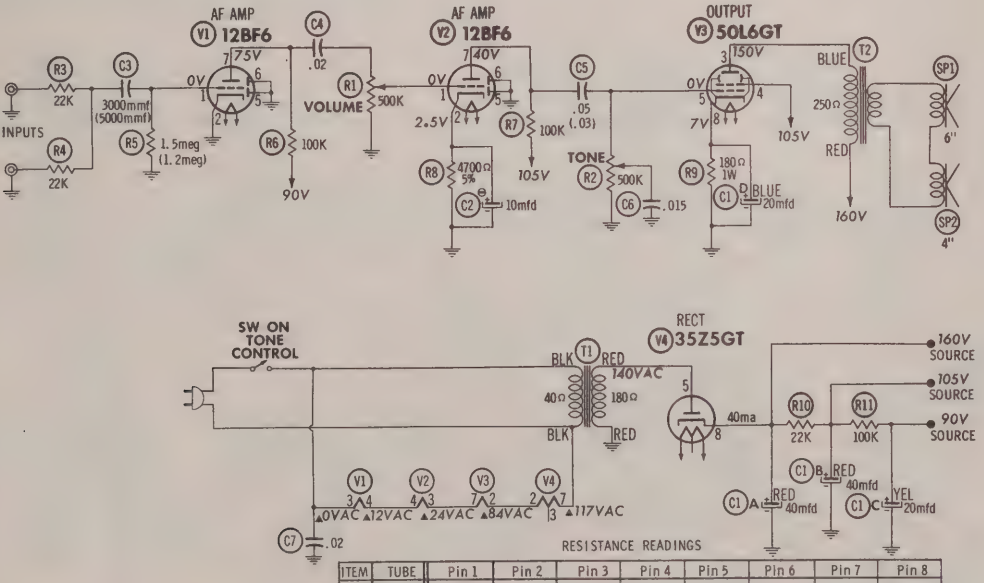
EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

PENTRON MODEL PS-5

PENTRON
MODEL PS-5



TRADE NAME	Pentron Model PS-5
MANUFACTURER	The Pentron Corp., 777 S. Tripp Ave., Chicago 24, Illinois
TYPE SET	AC Operated 4 Tube Audio Amplifier
POWER SUPPLY	110-120 Volts AC, 50-60 Cycles RATING 30 Watts, .32 Amp. @ 117 Volts AC



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V1	12BF6	1.5meg	0Ω	▲ 0Ω	▲ 11Ω	0Ω	0Ω	†220K	
V2	12BF6	0Ω	4700Ω	▲ 18Ω	▲ 11Ω	0Ω	0Ω	†120K	
V3	50L6GT	NC	▲ 42Ω	†250Ω	†22K	500K	NC	▲ 18Ω	180Ω
V4	35Z5GT	NC	▲ 42Ω	▲ 79Ω	NC	180Ω	TP	▲ 38Ω	¶

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 8 OF V4. NC NO CONNECTION
▲ MEASURED FROM PIN 3 OF V1. TP TIE POINT

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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SET 472 FOLDER 9

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V1	AF Amplifier	12BF6	V3	Output	50L6GT
V2	AF Amplifier	12BF6	V4	Rectifier	35Z5GT

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	PENTRON PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	40	150		PR4-200	BBRQ44315C	WQ230	CDB-Q-1001	TVA-4750	
B	40	150							
C	20	150							
D	20	25							
C2	10	25		PRS1250	BBR10-25	TC22	TD-10-25	TVA-1204	Note 1

Note 1. Some versions may use 5mfd in this application.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	3000	(5000mmf) *	BPD-003	DD-302	BYA10D3	CCD-302	B-230	5HK-D30
C4	.02 150V		P288N-02	DD-203	CUB2S2	4DP-2-203	GEM-412	2TM-S2
C5	.05 200V	(.03)*	P288N-05	DD-503	CUB2S5	4DP-3-502	GEM-415	2TM-S5
C6	.015 400V		P488N-015	DD-153	CUB4S15	4DP-1-153	GEM-4115	4TM-S15
C7	.02 400V		P488N-02	DD-203	CUB4S2	4DP-2-203	GEM-412	4TM-S2

* Alternate Value

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	PENTRON PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	500K	½	BA811-1274	B-58	A47-500K-Z	Q13-133	U48	Volume
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R2A	500K	½	BA812-538	B-60-S	A47-500K-Z	Q13-133	U48	Tone
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
C	Switch			Not Req.	SWE-12	76-1	US-26	Power Off-On

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R3	22K	
R4	22K	
R5	1.5meg	(1.2meg) *

* Alternate Value.

ITEM No.	RATING	REMARKS
R6	100K	
R7	100K	
R8	4700Ω 5%	

ITEM No.	RATING	REMARKS
R9	180Ω 1W	
R10	22K	
R11	100K	

TRANSFORMER (POWER)

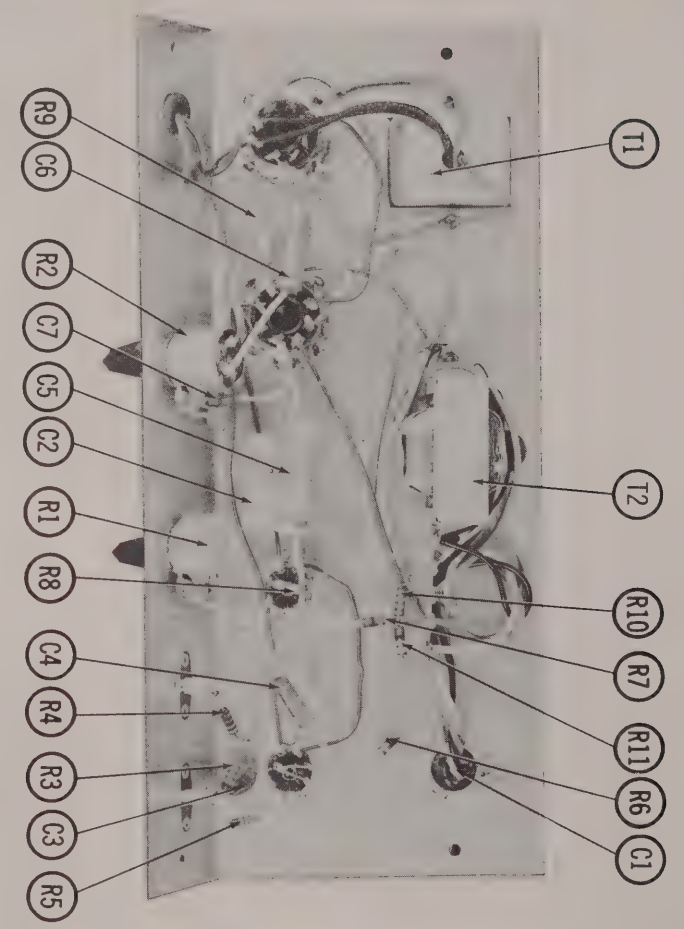
ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	PENTRON PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .17A	140V @ .040A		4436	22R12 ①				22R12 ①	

① Drill New Mounting Holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	PENTRON PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	2500Ω	6-8Ω	3313	24S64	A-2902	AU-604	A-3849	24S64		

CHASSIS—BOTTOM VIEW



SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	PENTRON PART No.	QUAM PART No.	
SP1	6"	PM	3-4Ω		6A1	
SP2	4"	PM	3-4Ω		4A1	

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

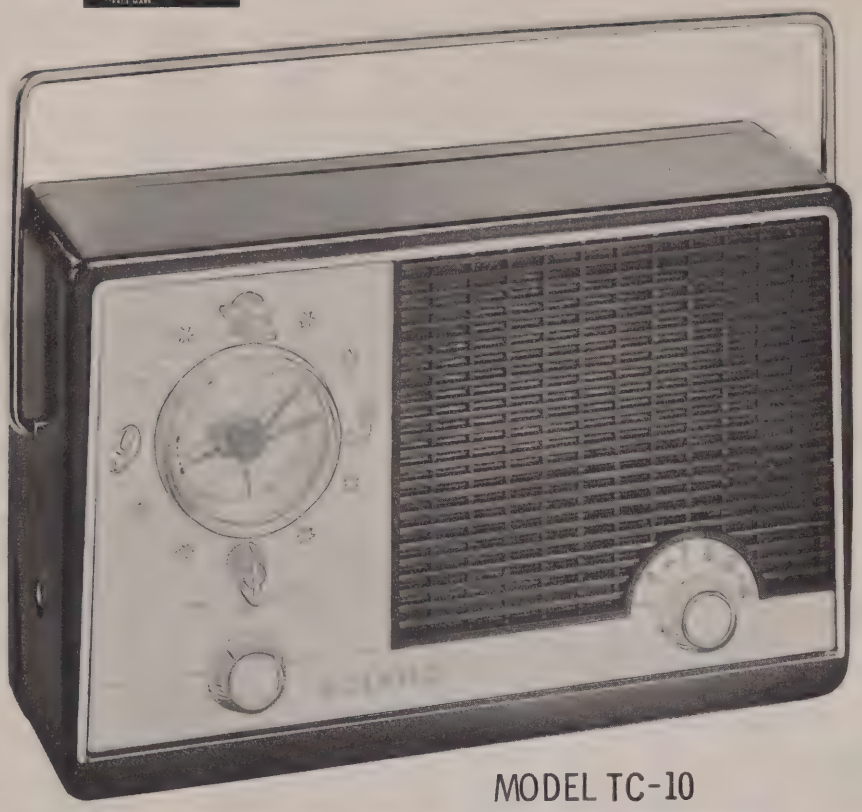
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

PHOTOFACT® Folder with CIRCUITRACE®

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

ROLAND MODELS
TC-10, TC-11 (71/288)

ROLAND MODELS
TC-10, TC-11 (71/288)



MODEL TC-10

ROLAND MODELS
TC-10, TC-11 (71/288)

TRADE NAME	Roland Models TC-10, TC-11 (71-288)
MANUFACTURER	Roland Radio Corp., 716 S. Columbus Ave., Mount Vernon, N. Y.
TYPE SET	Battery Operated Transistorized Portable AM Receiver With Clock
POWER SUPPLY	6 Volts DC (Radio) 1.5 Volts DC (Clock)
RATING	12MA@6 Volts DC (Radio) .65MA@1.5 Volts DC (Clock)
TUNING RANGE—BROADCAST	540 — 1620KC

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools:

A1, A2, A3.....GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987
WALSCO #2531

A4, A6.....GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

A5.....GENERAL CEMENT #8282, 8606, 8606L, 9091
WALSCO #2526, 2541, 2543, 2544

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to Converter base. Low side to chassis.	455KC (400∿ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3	Adjust for maximum output.
2.		Loop	1620KC	"	"	A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	600KC	600KC	"	A5	Adjust for maximum output while rocking tuning gang.
4.		"	1400KC	Tune to 1400KC Signal.	"	A6	"

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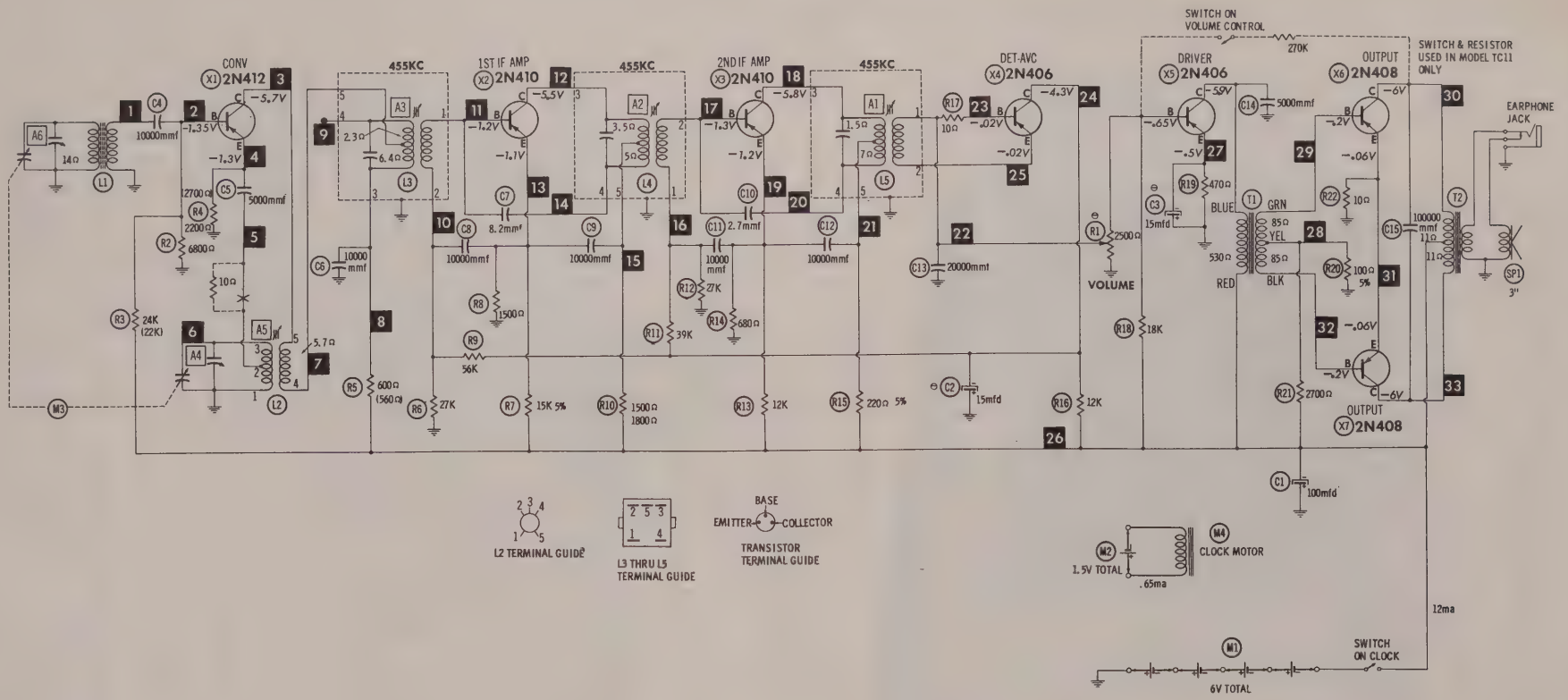

RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE.

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

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ROLAND MODELS TC-10, TC-11 (71/288)

PARTS LIST AND DESCRIPTIONS

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA				NOTES
			CBS PART No.	RCA PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N412	Converter		2N412	2N486	2N412	PNP
X2	2N410	1st IF Amplifier		2N410	2N483	2N410	PNP
X3	2N410	2nd IF Amplifier		2N410	2N483	2N410	PNP
X4	2N406	Detector		2N406	2N633	2N406	PNP
X5	2N406	Driver		2N406	2N633	2N406	PNP
X6	2N408	Output		2N408	2N362	2N408	PNP } Matched
X7	2N408	Output		2N408	2N362	2N408	PNP } Pair

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	ROLAND PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1	100	10	581051	PWE10100	NLW100-10	TT15X100	ML100-15	TE-1119.3	
C2	15	12		XPP-12015	NLW15-15	TT10X15	ML15-25	TE-1129	Note 1
C3	15	12		XPP-12015	NLW15-15	TT10X15	ML15-25	TE-1129	Note 1

Note 1. Some versions may use 10mfd in this application (Part #581052).

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C5	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D5
C6	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C7	8.2		NPO-SI 8.2		C10V82C			10TCC-V82
C8	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C9	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C10	2.7	#515065						10TCC-V27
C11	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C12	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C13	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C14	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C15	100000			DDA-104	CUB2P1	IDP-2-104	BT-010	5HK-P10

Roland Part Number.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ROLAND PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1	2500Ω	.2	368056					Volume, Note 1

Note 1. Model TC-11 uses Part #368065 (with switch).

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R2	6800Ω	
R3	24K	(22K) *
R4	2200Ω	(2700Ω) *
R5	600Ω	(560Ω) *
R6	27K	
R7	15K 5%	
R8	1500Ω	

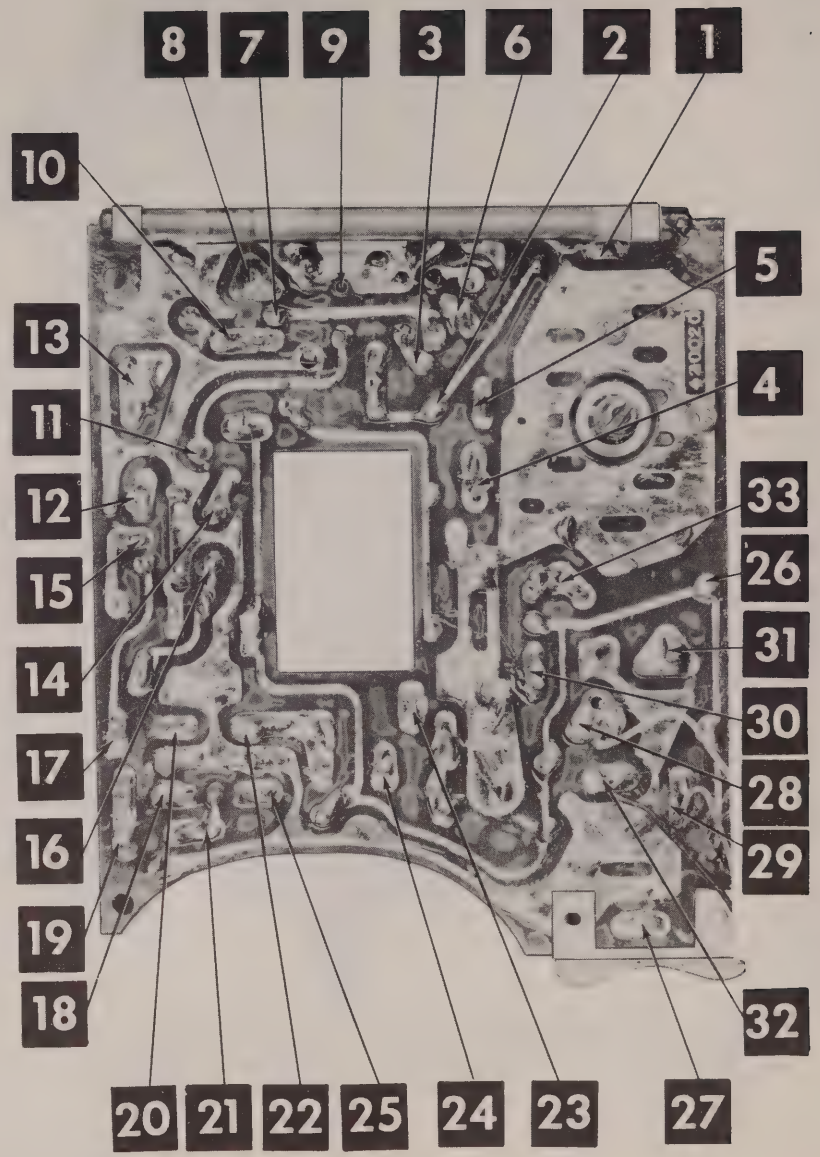
ITEM No.	RATING	REMARKS
R9	56K	
R10	1500Ω	(1800Ω) *
R11	39K	
R12	27K	
R13	12K	
R14	680Ω	
R15	220Ω 5%	(180Ω) *

ITEM No.	RATING	REMARKS
R16	12K	
R17	10Ω	
R18	18K	
R19	470Ω	
R20	100Ω 5%	
R21	2700Ω	
R22	10Ω	

* Alternate Value.

PRINTED BOARD

A Howard W. Sams CIRCUITRACE* Photo



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		ROLAND PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	464032						
L2	Osc. Coil	455084						
L3	1st IF Trans.	450026						
L4	2nd IF Trans.	450027						
L5	3rd IF Trans.	450028						

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	ROLAND PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	1.5	1	430580	TR-4①		TA-28①	TR-4①		① Use Original Frame

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	ROLAND PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	200Ω	3-4Ω	430579							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	ROLAND PART No.	QUAM PART No.	
SP1	3"	PM	3-4Ω	409013		

BATTERIES

ITEM No.	VOLTAGE	ROLAND PART No.	REPLACEMENT DATA						NOTES
			BURGESS		EVEREADY		MALLORY		
			"A"	"B"	"A"	"B"	"A"	"B"	
M1	1.5V			930		1015		M-15R	4 Required
M2	1.5V			930		1015		M-15R	1 Required (clock)

MISCELLANEOUS

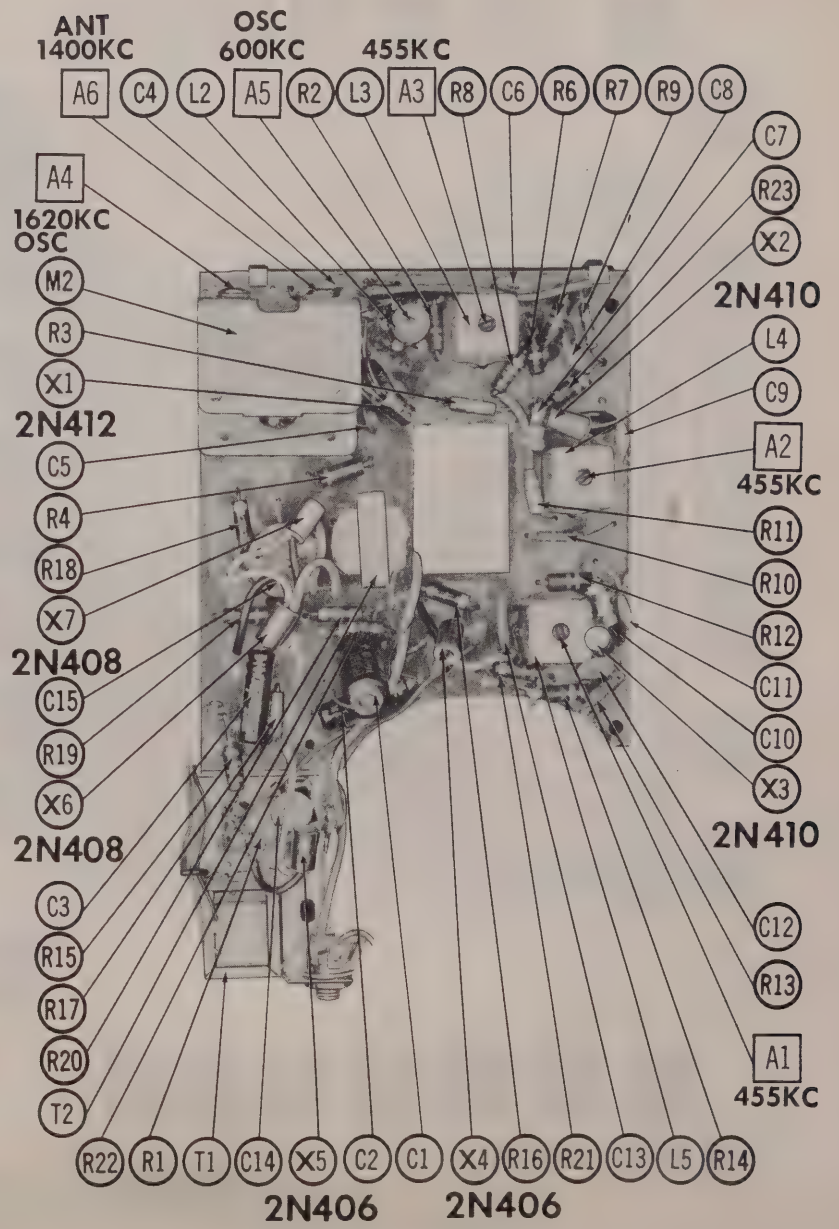
ITEM No.	PART NAME	ROLAND PART No.	NOTES
M3	Tuning Cap	590055	2 Gang, Model TC-10 (Ant. 8—129mmf, Osc. 14—97mmf.)
	Tuning Cap	590057	2 Gang, Model TC-11
M4	Clock	384021	Model TC-10
	Clock	384025	Model TC-11
	Printed Board	420020	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	272309	Tuning, Model TC-10
Knob	272323	Tuning, Model TC-11
Knob	272310	Volume
Knob	272311	Clock, Model TC-10
Knob	272322	Clock, Model TC-11
Cabinet	250490	Turquoise, Model TC-10
Cabinet	250600	Turquoise, Model TC-11
Cabinet	250491	Ebony, Model TC-10
Cabinet	250601	Ebony, Model TC-11
Handle	761132	
Indicator	272324	Tuning, Model TC-11

CHASSIS—TOP VIEW



PHOTOFACT® Folder

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

SABA MODELS 200-9C, 200-9T

SABA MODELS
200-9C, 200-9T

MODEL 200-9C

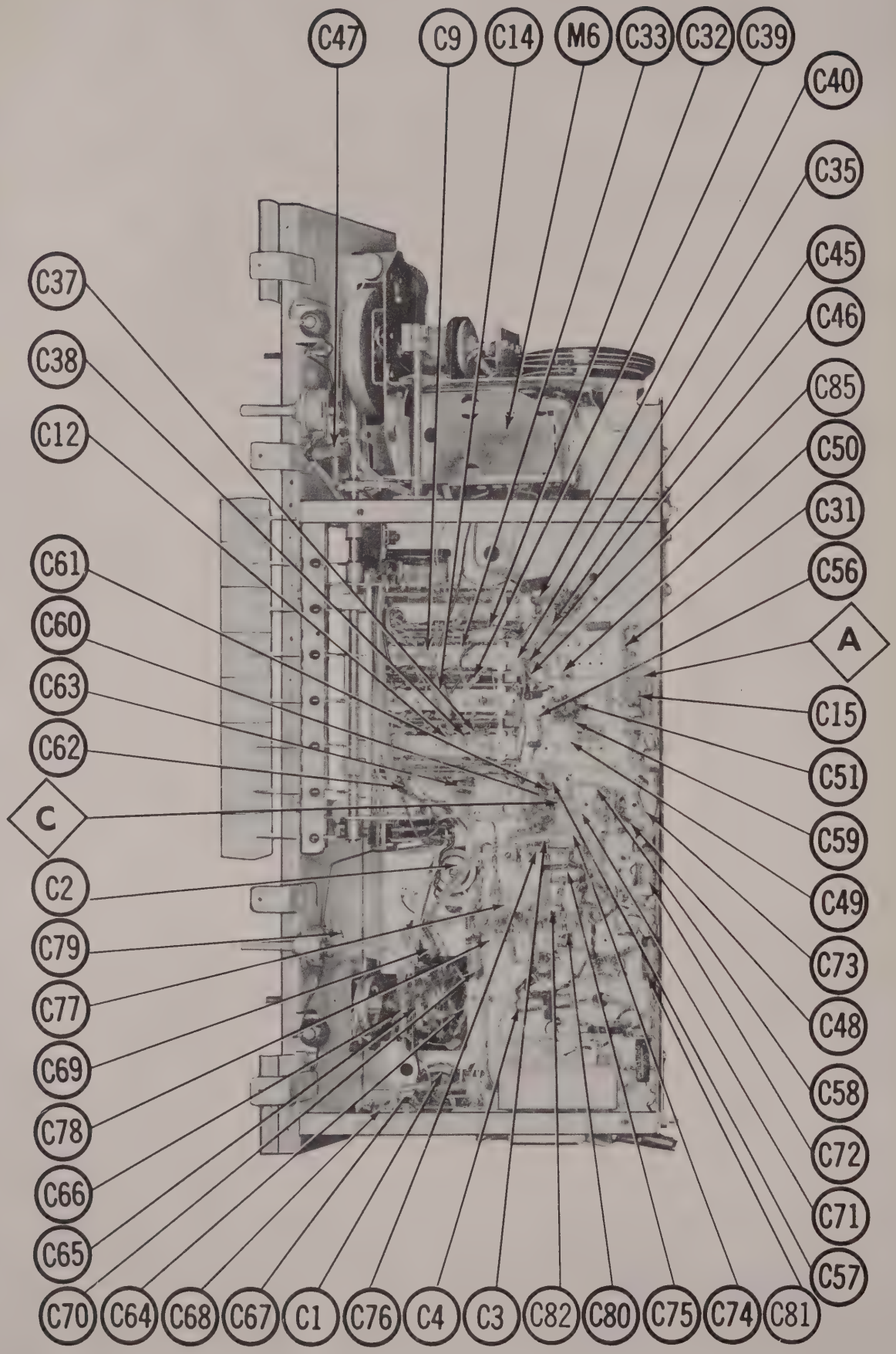
SABA MODELS
200-9C, 200-9T

TRADE NAME	Saba Models 2009C, 2009T			
IMPORTER	A. E. Dufenhorst Co., 121 N. Third St., Rockford, Illinois			
TYPE SET	AC Operated 9 Tube FM-BC-SW-LW Receiver With 4 Speed Automatic Record Changer			
POWER SUPPLY	110/125/150/220 Volts AC, 60 Cycles		RATING 59 Watts, .60 Amp. @ 117 Volts AC (FM)	
TUNING RANGES	BROADCAST FREQ. MOD.	510-1630KC 88-108MC	LONG WAVE SHORT WAVE	145-360KC 5.9-18.9MC

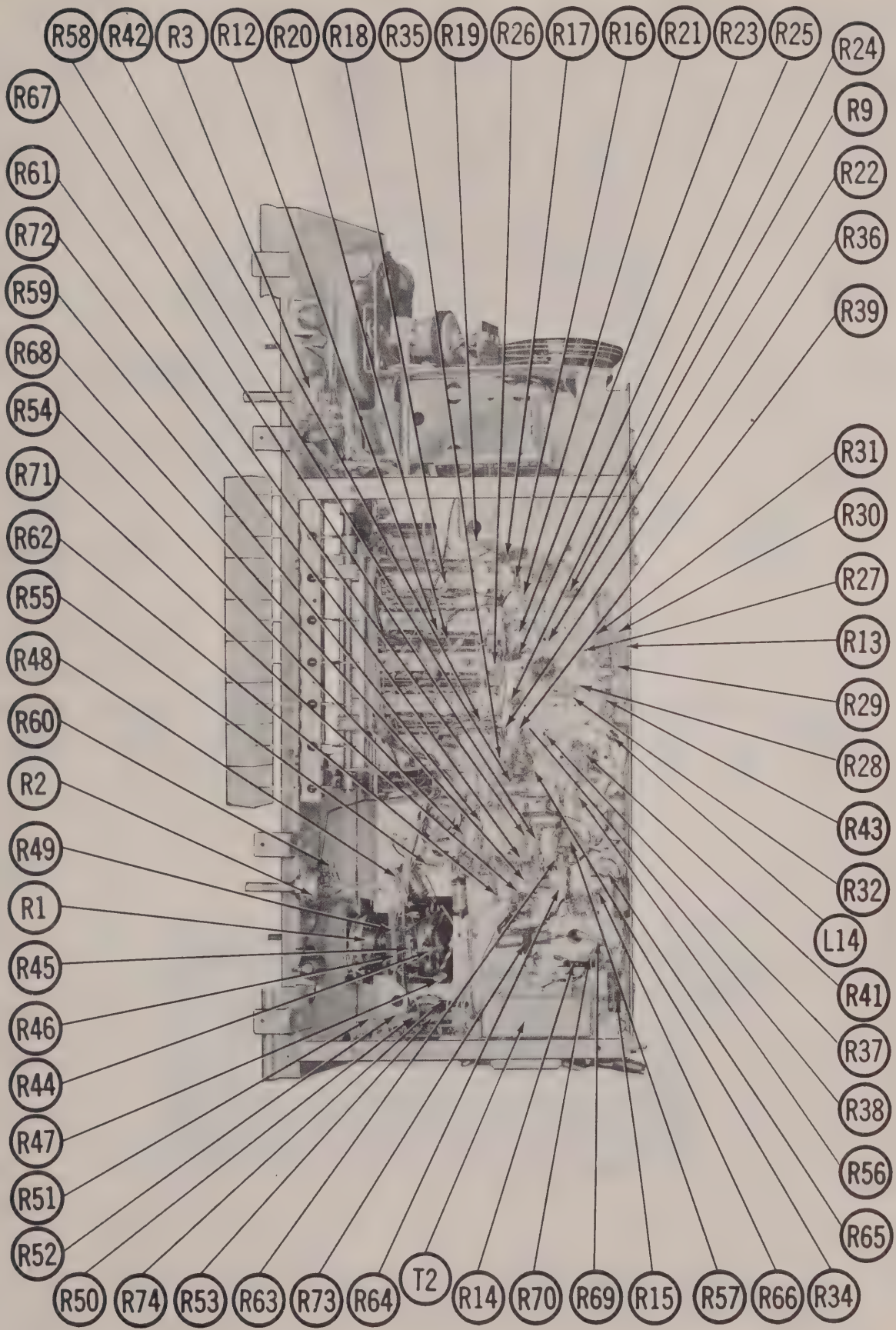
FOR SERVICE INFORMATION ON RECORD CHANGER - SEE DUAL 1004 - PHOTOFACT SET 453 FOLDER 6.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America



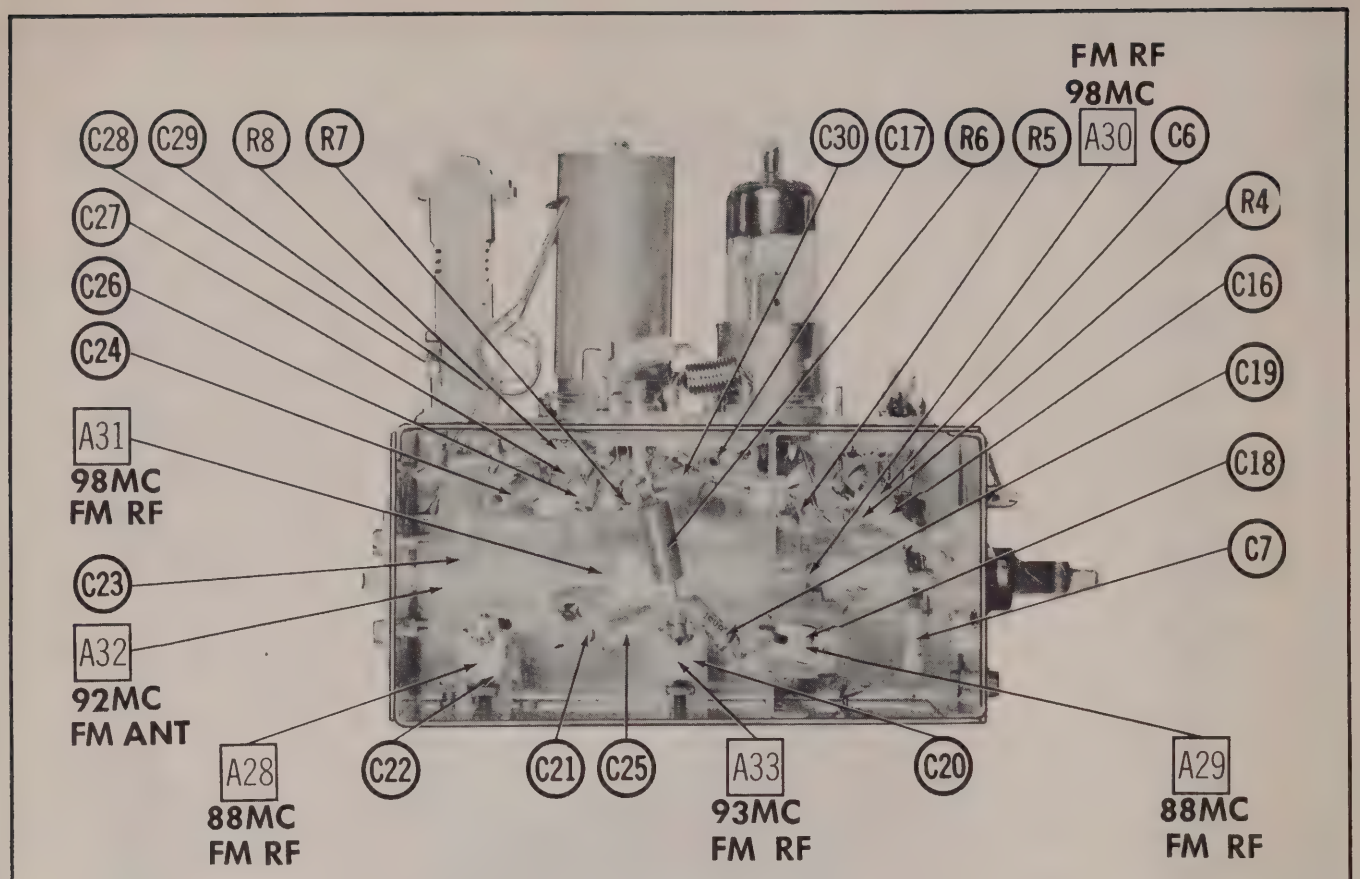
CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



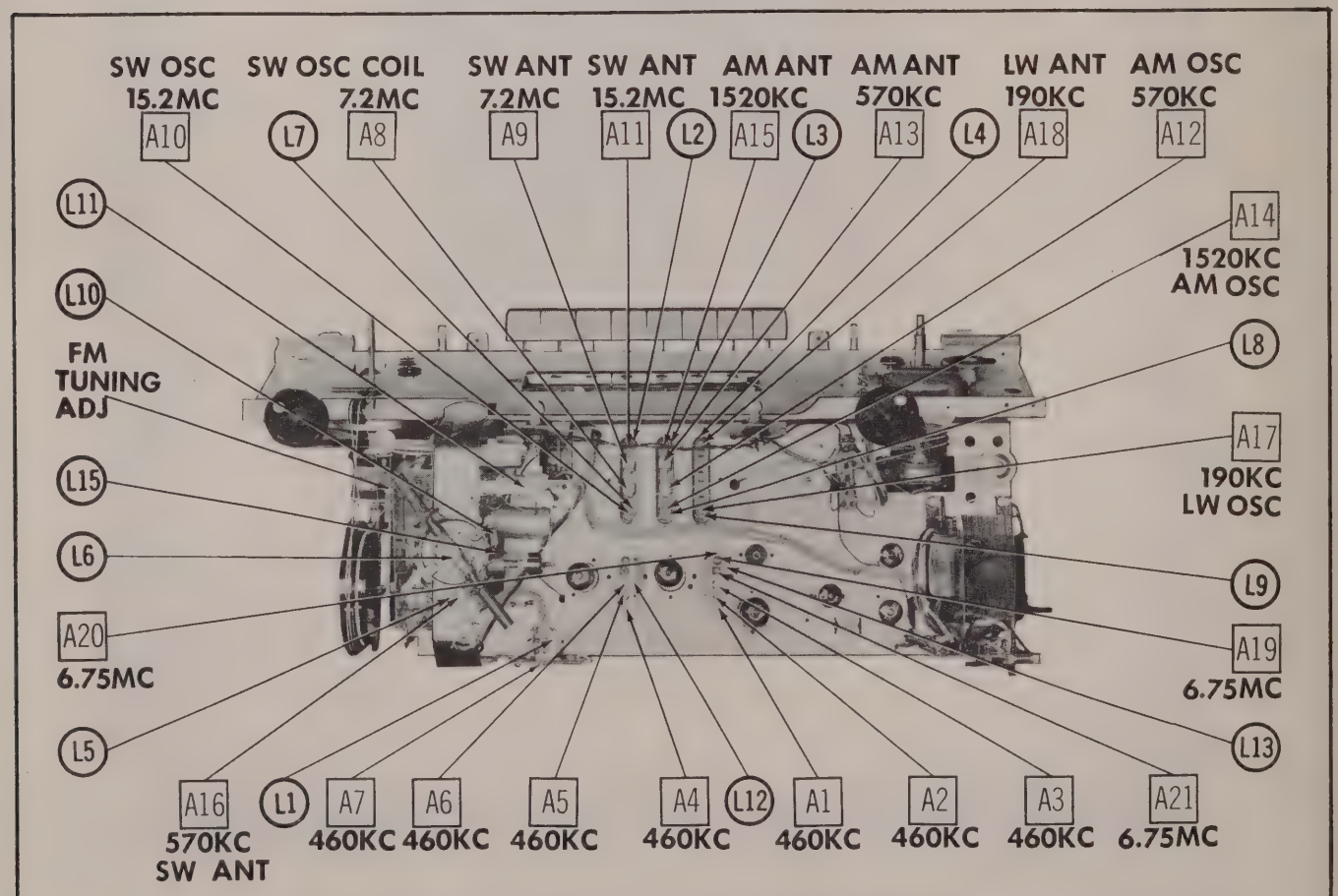
CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

SABA
MODEL 200-9C

FOLDER 11



FM RF SUBCHASSIS



CHASSIS-TOP VIEW – INDUCTOR AND ALIGNMENT IDENTIFICATION

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Turn Volume control fully counterclockwise. Adjust Hum adjustment for MINIMUM hum in speakers.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.
Suggested Alignment Tools: A1 thru A9, A12, A13, A16 thru A27, A33.. GENERAL CEMENT #8282, 8606, 8606L, 9091
WALSCO #2526, 2541, 2543, 2544
A10, A11, A14, A15, A28, A29 ..... GENERAL CEMENT #5097, 8727
WALSCO #2515

AM ALIGNMENT

Connect the negative lead of a 4.5 volt bias supply to point (A). Positive to chassis.
Connect speaker during alignment.
Set Treble control fully counterclockwise.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	10000mmf	High side to pin 1 (screen) of AM Mixer. Low side to chassis.	460KC (400∿ 30% AM)	AM	High end stop	Across voice coil	A1, A2, A3	Detune A3 SLIGHTLY. Adjust A1, A2, and A3 in numerical order for maximum output.
2.	"	"	"	"	"	"	A4, A5, A6	Detune A6 SLIGHTLY. Adjust A4, A5 and A6 in numerical order for maximum output, then turn A6 counterclockwise to decrease meter reading 5%.
3.	200mmf & 400Ω in series	Across AM antenna plug.	"	"	"	"	A7	Adjust for MINIMUM output.
4.	"	Across AM antenna plug. (Rotary antenna turned to "AUS").	7.2MC	SW	7.2MC	"	A8, A9	Adjust for maximum output.
5.	"	"	15.2MC	"	15.2MC	"	A10, A11	"
6.		Loop (Rotary antenna turned to "On")	570KC	AM	570KC	"	A12, A13	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
7.		"	1520KC	"	1520KC	"	A14, A15	Adjust for maximum output. Repeat steps 6 and 7 if necessary.
8.	200mmf & 400Ω in series	Across AM antenna terminals.	570KC	"	570KC	"	A16	Adjust for maximum output.
9.	"	"	190KC	LW	190KC	"	A17, A18	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100K (±1%) resistors in series from point (B) to chassis. The junction of these two resistors is alignment point (D) as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
10.	1000mmf Ceramic Capacitor	High side to pin 6 (grid) of FM Converter. Low side to chassis.	6.75MC (Unmod)	FM	92MC	DC probe to point (B). Common to chassis.	A19	Detune A21 by turning counterclockwise. Adjust A19 for maximum deflection.
11.	"	"	"	"	"	DC probe to point (C). Common to point (D).	A20	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
12.	"	"	"	"	"	DC probe to point (B). Common to chassis.	A21	Adjust for maximum deflection.
13.	"	"	"	"	"	"	A22, A23, A24	Detune A24 by turning counterclockwise. Adjust A22, A23 and A24 in numerical order for maximum deflection.
14.	"	"	"	"	"	"	A25, A26, A27	Detune A27 by turning counterclockwise. Adjust A25, A26 and A27 in order of maximum deflection.
15.	"	"	"	"	"	"		Readjust A21 for MINIMUM deflection. Voltage should be approximately 10 volts. Repeat steps 10 and 11.

ALIGNMENT INSTRUCTIONS (cont)

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

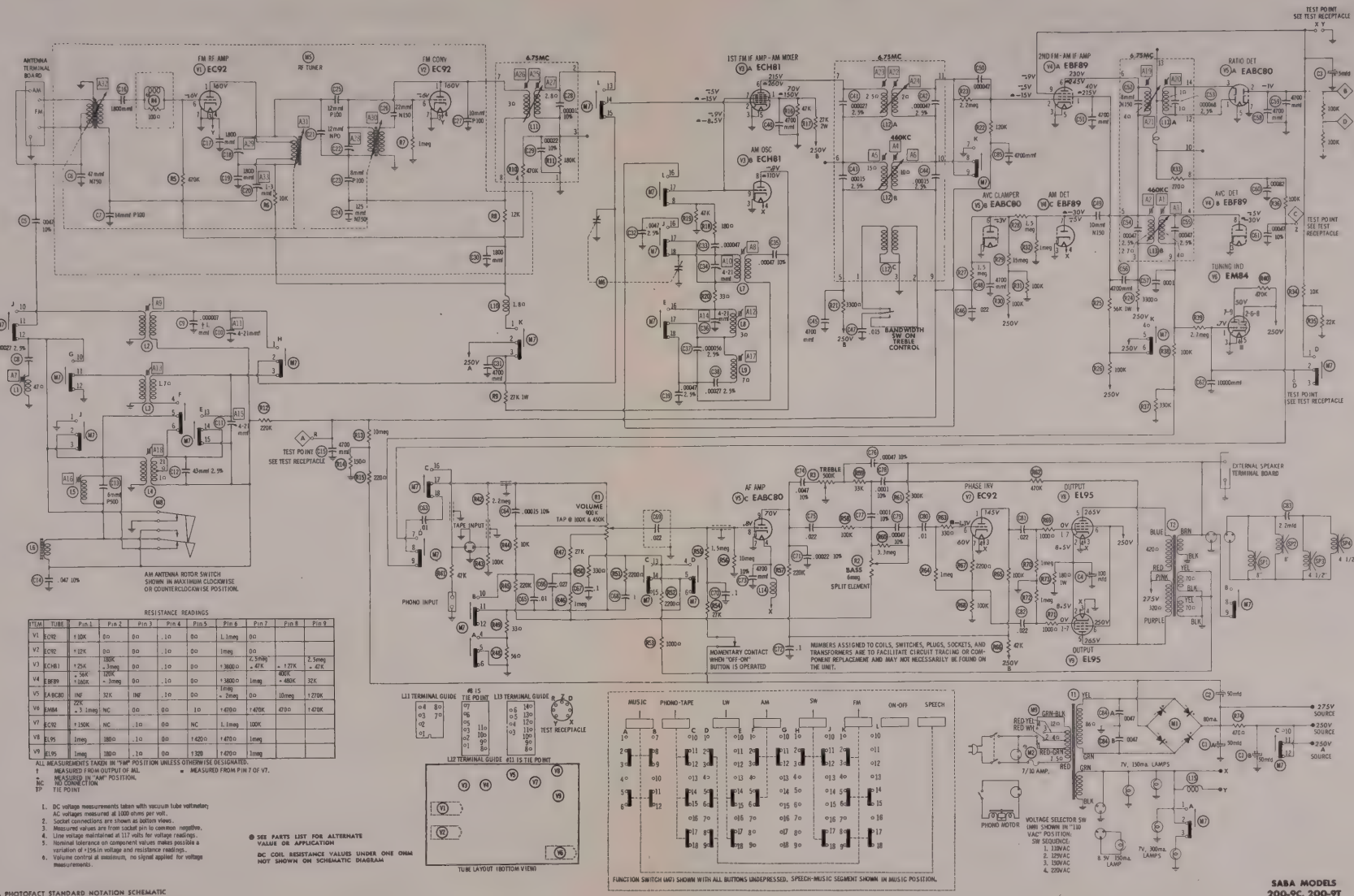
	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
10.	1000mmf Ceramic Capacitor	High side to pin 6 (grid) of FM Converter. Low side to chassis.	6.75MC (450KC Swp)	FM	Point of non-interference	Vert. Amp. to point Ⓑ. Low side to chassis.	A19	Disconnect Stabilizing capacitor (C3). Detune A21 by turning counterclockwise. Adjust A19 for maximum gain and symmetry of response similar to Fig. 1. Reconnect C3.
11.	"	"	"	"	"	Vert. Amp. to point Ⓒ. Low side to chassis.	A20	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A19 for maximum amplitude and straightness of crossover lines.
12.	"	"	"	"	"	Vert. Amp. to point Ⓑ. Low side to chassis.	A21	Disconnect C3. Adjust for maximum gain and symmetry of response similar to Fig. 1.
13.	"	"	"	"	"	"	A22, A23, A24	Detune A24 by turning counterclockwise. Adjust A22, A23 and A24 in order for maximum gain and symetry of response.
14.	"	"	"	"	"	"	A25, A26, A27	Detune A27 by turning counterclockwise. Adjust A25, A26 and A27 for maximum gain and symmetry of response.
15.	"	"	"	"	"	"	A21	Readjust for MINIMUM response. Repeat steps 10 and 11, if necessary. If not, reconnect C3.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
16.		Across FM antenna terminals	88MC (Unmod)	FM	88MC	DC probe to point Ⓑ. Common to chassis.	A28, A29	Adjust for maximum deflection.
17.		"	98MC	"	98MC	"	FM Tuning Adjust.	"
18.		"	"	"	"	"	A30, A31	"
19.		"	92MC	"	92MC	"	A32	"
20.		"	93MC	"	93MC	"	A33	Disconnect plate voltage from FM RF Amp. Increase signal generator output to approximately .5MV. Adjust A33 for MINIMUM deflection. Reconnect plate voltage. Repeat steps 16 and 19.

FIG. 1

FIG. 2



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	EC92	†10K	0Ω	0Ω	.1Ω	0Ω	1.1meg	0Ω		
V2	EC92	†12K	0Ω	0Ω	.1Ω	0Ω	1meg	0Ω		
V3	ECH81	†25K	100K .3meg	0Ω	.1Ω	0Ω	†3600Ω	2.5meg ▲47K	▲ †17K	2.5meg ▲47K
V4	EBF89	▲56K †180K	†20K ▲.3meg	0Ω	.1Ω	0Ω	†3800Ω	1meg	400K ▲480K	32K
V5	EABC80	INF	32K	INF	.1Ω	0Ω	1meg ▲.2meg	0Ω	10meg	†270K
V6	EM84	22K ▲3.1meg	NC	0Ω	0Ω	1Ω	†470Ω	†470K	470Ω	†470K
V7	EC92	†150K	NC	.1Ω	0Ω	NC	1.1meg	100K		
V8	EL95	1meg	180Ω	.1Ω	0Ω	†420Ω	†470Ω	1meg		
V9	EL95	1meg	180Ω	.1Ω	0Ω	†32Ω	†470Ω	1meg		

ALL MEASUREMENTS TAKEN IN "AM" POSITION UNLESS OTHERWISE DESIGNATED.
† MEASURED FROM OUTPUT OF ANT. ▲ MEASURED FROM PIN 7 OF V7.
MEASURED IN "AM" POSITION.
NC NO CONNECTION
TP TIE POINT

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

● SEE PARTS LIST FOR ALTERNATE VALUE ON APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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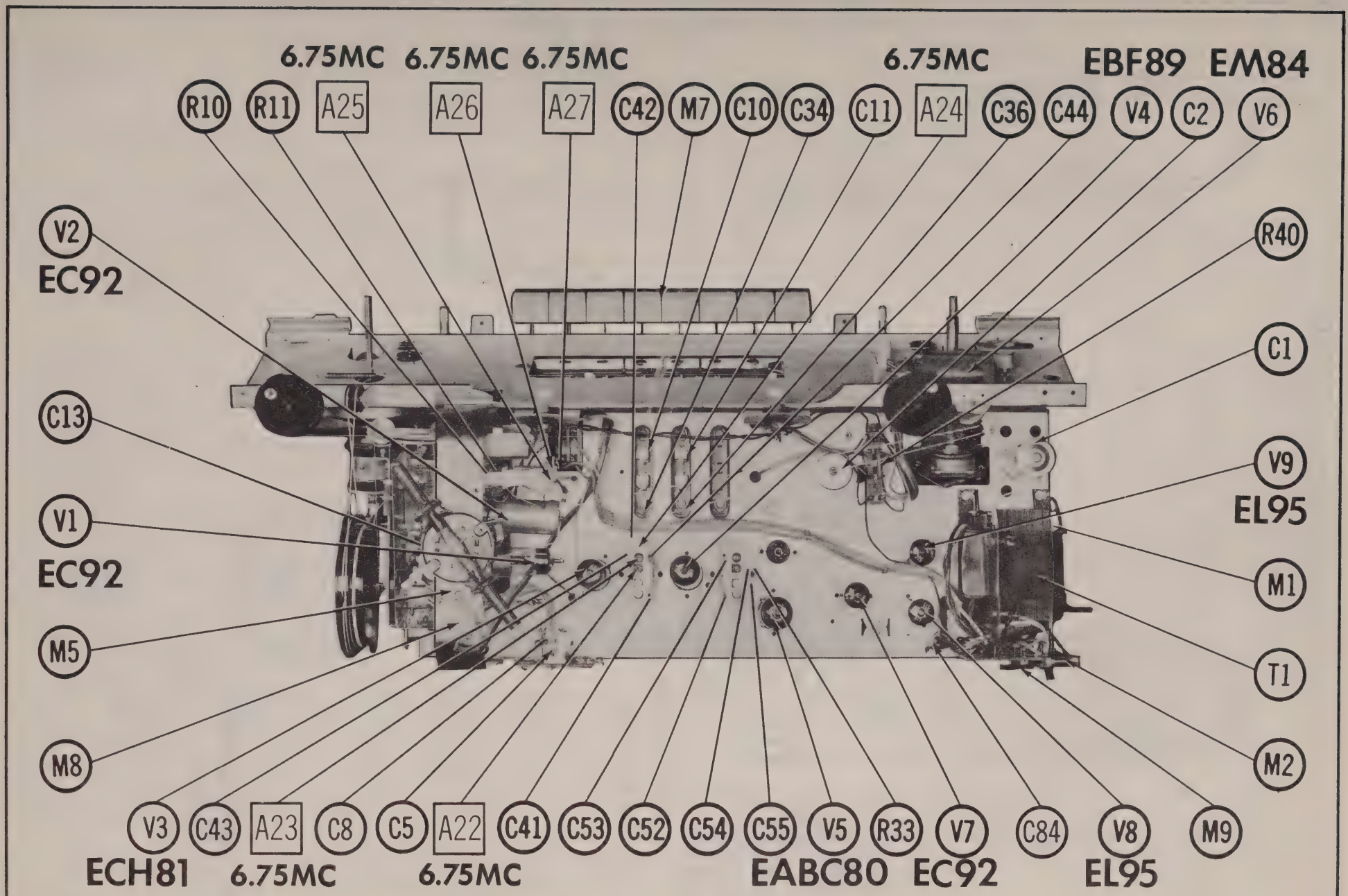
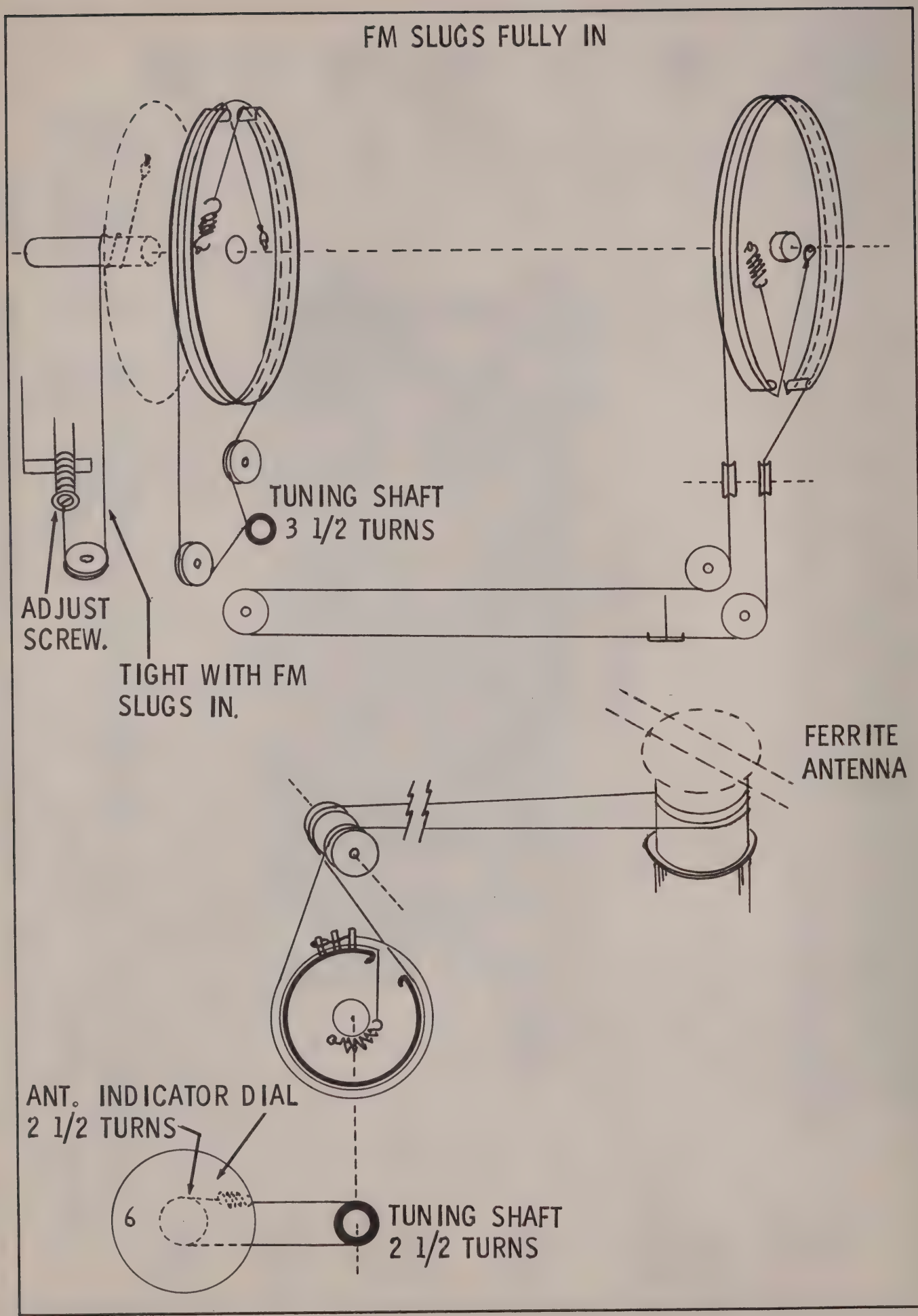
SABA MODELS 200-9C, 200-9T



CHASSIS TOP VIEW - ALIGNMENT, TUBE, CAPACITOR, RESISTOR & MISC. IDENT.


FM SLUGS FULLY IN
TUNING SHAFT
3 1/2 TURNS
ADJUST
SCREW.
TIGHT WITH FM
SLUGS IN.
FERRITE
ANTENNA
ANT. INDICATOR DIAL
2 1/2 TURNS
6
TUNING SHAFT
2 1/2 TURNS

PARTS LIST AND DESCRIPTIONS

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V1	FM RF Amp.	EC92
V2	FM Converter	EC92
V3	1st FM IF Amp. - AM Mixer - AM Osc.	ECH81
V4	2nd FM-1st AM IF Amp. - AM Det. - AVC Det.	EBF89
V5	Ratio Detector - AVC Clamper - AF Amp.	EABC80
V6	Tuning Indicator	EM84
V7	Phase Inverter	EC92
V8	Output	EL95
V9	Output	EL95

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	SABA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	50	350	3257036000	PRS2420	BBRD4445	TCD-78	TDLD-32	R2462	
B	50	350							
C2	50	350	3256028000	PRS1680	BR5035	TC79	TD-50-450	TVA-1713	
C3	5	70	3251193000	SRE150V5	NLW5-100	TT150X5	TD-8-150	TE-1404	
C4	100	12	3251117000	SRE12V100	BBR100-15	TT15X100	ML100-15	TE-1135	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	.0047 500V 10%		V84C6D47-10%		PM6D47	6DP-1-472	GEM-16247	6TM-D47
C6	47 N750		N750-SI 47	TCN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C7	14 P100	#3201201000						
C8	.000027 125V 2.5%	#3151127000				DM-15-270G		
C9	.000007 125V ±1mmf		NPO-SI 6.8	TCZ-6R8	C10V7C	CCTO-6R8	CNO-568	10TS-V7.5
C10	4-21	#3234011000						
C11	4-21	#3234011000						
C12	43 2.5%	#3151210000				DM-15-430G		
C13	6 P500	#3201025000						
C14	.047 125V 10%		V84C2S47-10%		PM2S47	4DP-3-473	GEM-1615	2TM-S47
C15	4700		SI 4700	D6-472	BYA10D47M	CCD-472	UC-5247	5HK-D47
C16	1800		SI 1800	D6-182	L10D18	CCD-182	UC-5218	5GA-D18
C17	1800		SI 1800	D6-182	L10D18	CCD-182	UC-5218	5GA-D18
C18								
C19	1800		SI 1800	D6-182	L10D18	CCD-182	UC-5218	5GA-D18
C20	1-3	#3231001000				VC-1		
C21	12 NPO		NPO-SI 12	TCZ-12	C10Q12C	CCTO-120	CNO-412	10TCC-Q12
C22								
C23	8 P100	#3201047000						
C24	125 N750		N750-SI 130	TCN-130		CCTN-151		
C25	12 P100	#3201050000						
C26	22 N150	#3206048000				*		10TCP-Q22
C27	10 P100	#3201047000						
C28	.00001 125V 10%			DD-100	L10Q1	CCD-100	GP410	10TS-Q10
C29	.00022 125V 10%			DD-221	L10T22	CCD-221	GP322	10TS-T22
C30	1800		SI 1800	D6-182	L10D18	CCD-182	UC-5218	5GA-D18
C31	4700		SI 4700	D6-472	BYA10D47M	CCD-472	UC-5247	5HK-D47
C32	.0047 125V	#3151154000				DM-20-472G		
C33	.000047 125V			DD-470	L10Q47	CCD-470	UC-5447	5GA-Q47
C34	4-21	#3234011000						
C35	.00047 500V 10%			DD-471	5R5T47	CCS-471	10TS-T47	CCS-471
C36	4-21	#3234011000						
C37	.000056 125V 2.5%	#3151131000				DM-15-560G		
C38	.00027 125V 2.5%	#3151139000				DM-15-271G		
C39	.00047 125V 2.5%	#3151142000				DM-15-471G		
C40	4700		SI 4700	D6-472	BYA10D47M	CCD-472	UC-5247	5HK-D47
C41	.000027 125V 2.5%	#3151127000				DM-15-270G		
C42	.000047 125V 2.5%	#3151130000				DM-15-470G		
C43	.00015 125V 2.5%	#3151136000				DM-15-151G		
C44	.00015 125V 2.5%	#3151136000				DM-15-151G		
C45	4700		SI 4700	D6-472	BYA10D47M	CCD-472	UC-5247	5HK-D47
C46	.022 250V		P488N-022		CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C47	.015 125V		P288N-015	DD16-153	CUB6S15	4DP-1-153	GEM-4115	2TM-S15
C48	4700		SI 4700	D6-472	BYA10D47M	CCD-472	UC-5247	5HK-D47
C49	10 N150	#3213013000				*		
C50	.000047 125V			DD-470	L10Q47	CCD-470	UC-5447	5GA-Q47
C51	4700		SI 4700	D6-472	BYA10D47M	CCD-472	UC-5247	5HK-D47
C52	8 N150	#3206049000				*		10TCP-V8.2
C53	.000068 125V 2.5%	#3151132000				DM-15-680G		
C54	.00047 125V 2.5%	#3151149000				DM-15-471G		
C55	.00047 125V 2.5%	#3151149000				DM-15-471G		
C56	4700		SI 4700	D6-472	BYA10D47M	CCD-472	UC-5247	5HK-D47
C57	.0001 125V		P688N-0001	DD-101	L10T1	CCD-101	UC-531	6TM-T1
C58	4700		SI 4700	D6-472	BYA10D47M	CCD-472	UC-5247	5HK-D47
C59	4700		SI 4700	D6-472	BYA10D47M	CCD-472	UC-5247	5HK-D47
C60	.00082 125V			DD-821	5W5T82	CCD-821	B-382	5GA-T82
C61	.00047 125V 10%			DD-471	5R5T47	CCS-471	GP347	10TS-T47
C62	10000		SI 10000	D6-103	BYA10SI	CCD-103	B-110	5HK-SI
C63	.01 500V		P688N-01	DD-103	CUB6SI	6DP-2-103	GEM-611	6TM-SI
C64	.00015 125V 10%			DD-151	L10T15	CCS-151	GP315	10TS-T15
C65	.01 500V		P688N-01	DD-103	CUB6SI	6DP-2-103	GEM-611	6TM-SI
C66	.027 125V		P288N-03		CUB6S3	4DP-2-303	GEM-413	4TM-S3
C67	.1 125V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C68	.1 125V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C69	.022 125V	#3113001000						
C70	.1 125V			DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C71	.00022 125V 10%			DD-221	L10T22	CCD-221	GP322	10TS-T22
C72	.1 200V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C73	4700		SI 4700	D6-472	BYA10D47	CCD-472	UC-5247	5HK-D47
C74	.0047 500V 10%		V84C6D47-10%		PM6D47	6DP-1-472	GEM-16247	6TM-D47
C75	.022 500V		P688N-022		CUB6S22	6DP-2-223	GEM-6122	6TM-S22
C76	.00047 125V 10%			DD-471	5R5T47	CCS-471	GP347	10TS-T47
C77	.0001 125V 10%			DD-101	L10T1	CCD-101	GP531	6TM-T1
C78	.0001 125V 10%			DD-101	L10T1	CCD-101	GP531	6TM-T1
C79	.00047 125V 10%			DD-471	5R5T47	CCS-471	GP347	10TS-T47
C80	.01 500V		P688N-01	DD-103	CUB6SI	6DP-2-103	GEM-611	6TM-SI
C81	.022 500V		P688N-022		CUB6S22	6DP-2-223	GEM-6122	6TM-S22
C82	.022 125V		P288N-022		CUB4S22	4DP-2-223	GEM-4122	2TM-S22
C83	2.2mfd 125V		P292ZN-2.0		MP2W2			118P20502S2
C84A	.0047 500V		P688N-0047	DD2-502	BYC6DD5	6DP-1-472	B2X250	5HK-2D47
B	.0047 500V		P688N-0047			6DP-1-472		
C85	4700		SI 4700	D6-472	BYA10D47M	CCD-472	UC-5247	5HK-D47

FIXED CAPACITORS (cont)

Saba Part Number.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	SABA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	900K *	½	5803-000-554					Volume
R2	6meg †	½	5802-000-533					Bass
R3A	500K	½	5802-000-543					Treble
B	Switch							Bandwidth

* Taps @ 100K, 450K.

† Open at center, 3meg each side.

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	ITEM No.	RATING	ITEM No.	RATING	ITEM No.	RATING	ITEM No.	RATING	ITEM No.	RATING
R4	100Ω Note 1	R16	47K	R28	1.5meg	R40	470K	R52	2200Ω	R64	1meg
R5	470K	R17	27K 2W	R29	15meg	R41	47K	R53	1000Ω	R65	100K
R6	10K	R18	180Ω	R30	100K	R42	2.2meg	R54	27K	R66	47K
R7	1meg	R19	47K	R31	100K	R43	100K	R55	1.5meg	R67	2200Ω
R8	12K	R20	33Ω	R32	1meg	R44	10K	R56	10meg	R68	100K
R9	27K 1W	R21	3300Ω	R33	270Ω	R45	220K	R57	220K	R69	1000Ω
R10	470K	R22	120K	R34	10K	R46	1meg	R58	100K	R70	1meg
R11	180K	R23	2.2meg	R35	22K	R47	27K	R59	33K	R71	1000Ω
R12	220K	R24	3300Ω	R36	100K	R48	56Ω	R60	3.3meg	R72	1meg
R13	10meg	R25	56K 1W	R37	330K	R49	33Ω	R61	300K	R73	180Ω 1W
R14	150Ω	R26	100K	R38	100K	R50	330Ω	R62	470K	R74	470Ω
R15	220Ω	R27	1.5meg	R39	2.7meg	R51	2200Ω	R63	330Ω		

Note 1. Coil wound in resistor.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SABA PART No.	QUAM PART No.	
SP1	8"	PM	4-5Ω	5898-410-002		
SP2	8"	PM	4-5Ω	5898-410-002		
SP3	4½"	PM	4-5Ω	5898-010-003		
SP4	4½"	PM	4-5Ω	5898-010-003		

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	SABA PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.080A	B250C100 ①					① Selenium Type.

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		SABA PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	LW Ant. Coil	5806066004						
L2	SW Ant. Trans.							
L3	AM Ant. Trans.							
L4	LW Ant. Trans.							
L5	SW Ant. Coil	5803066004						
L6	Loopstick	3882002111						
L7	SW Osc. Coil							
L8	AM Osc. Coil							
L9	LW Osc. Coil							
L10	RF Choke							
L11	1st FM IF Trans.	5803910003						
L12A	2nd FM IF Trans.	5803410002						
B	1st AM IF Trans.							
C	Bandwidth Coil							
L13A	Ratio Detector	5803420002						
B	2nd AM IF Trans.							
L14	Fil. Choke		19-1000	19-1000	BC-561	4602		luh
L15	Fil. Choke		19-1000	19-1000	BC-561	4602		luh

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			SABA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2		7/10A 250V ① S/B 4/10A 250V ② S/B						

① For line voltages of 110-150V. ② For line voltages of 220V.

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA									
	SABA PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M3	KS2								

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	SABA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	220V Taps ② 150V, 125V 117V ② .60A	250V ② .080A	6.3V ② 3A	3818-101-111						

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	SABA PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	
M4	1004-DS † ♦		DU-13 † or DU-13SD † ♦ or DU-13D ♦	† Jewel ♦ Diamond

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.1	SEC.1	SABA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	4000Ω	2-4Ω	5890-410-004							
	PRI.2	SEC.2								
	4000Ω	200Ω								
		SEC.3								
		200Ω								

MISCELLANEOUS

ITEM No.	PART NAME	SABA PART No.	NOTES
M5	RF Tuner	5803900002	Complete (Less Tubes)
M6	Tuning Cap.		2 Gang
M7	Switch	5803500002	Function (Pushbutton type, includes music, phono-tape, LW, AM, SW, FM, Off-On & Speech)
M8	Switch	5803067003	Antenna
M9	Switch	5803500274	AC Input Selector

PHOTOFACT® Folder

SABA MODELS
200-90C, 200-90T

SABA MODELS
200-90C, 200-90T

MODEL 200-90C

SABA MODELS
200-90C, 200-90T

TRADE NAME	Saba Models 200-90C, 200-90T
IMPORTER	A. E. Dufenhorst Co., 121 N. Third Street, Rockford, Illinois
TYPE SET	AC Operated 9 Tube FM-BC-SW-LW Receiver With 4 Speed Automatic Stereo Record Changer.
POWER SUPPLY	110-125-150-220 Volts AC, 60 Cycles RATING 58 Watts, .58 Amp. @117 Volts AC
TUNING RANGE	BROADCAST 510-1630KC LONG WAVE 145-360KC FREQ. MOD. 88-108MC SHORT WAVE 5.9-18.9MC

FOR SERVICE ON RECORD CHANGER — SEE DUAL 1004 — PHOTOFACT SET 453 FOLDER 6

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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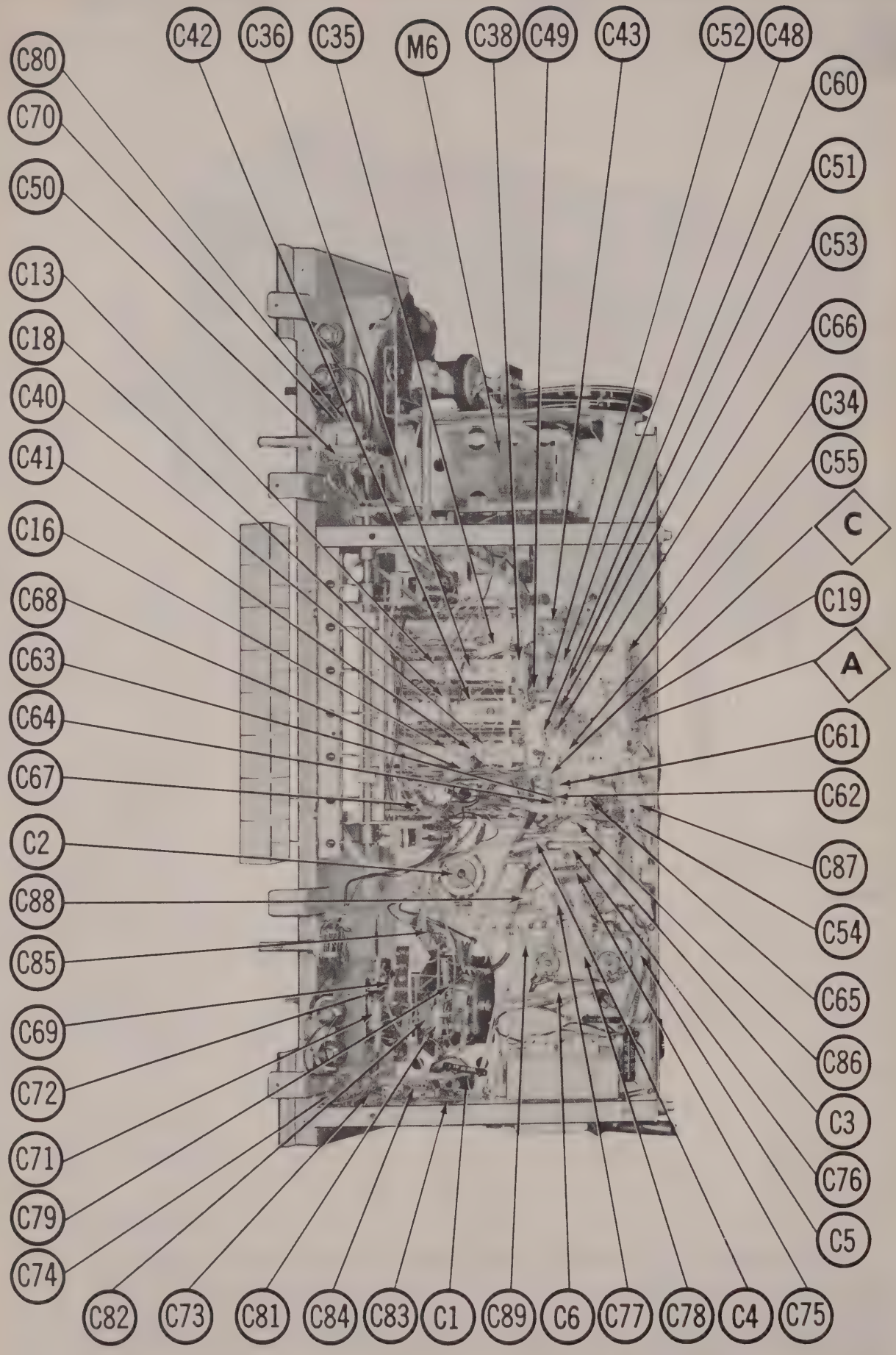
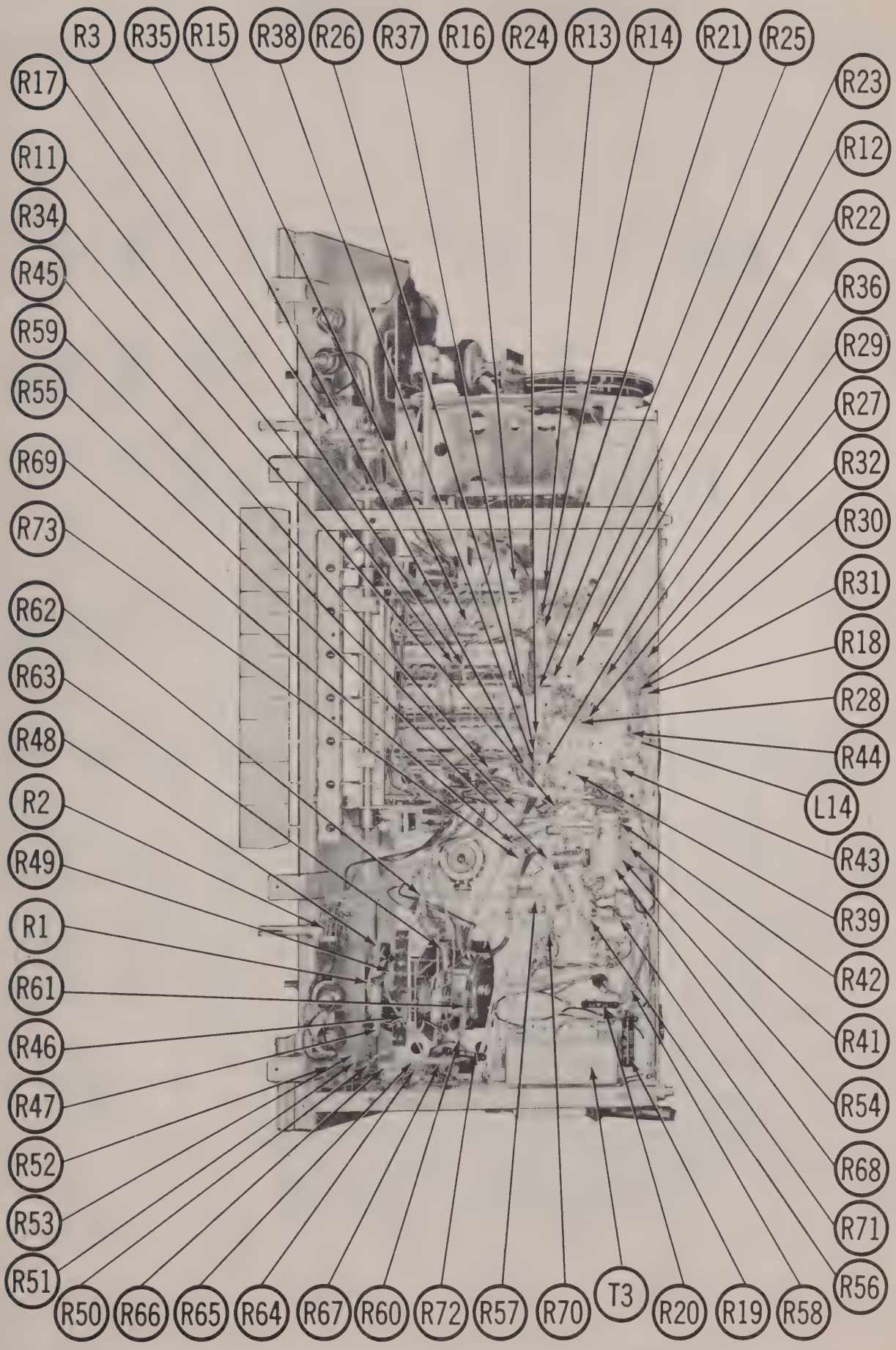
JN404



CHASSIS BOTTOM VIEW - CAPACITOR & MISC. IDENT.

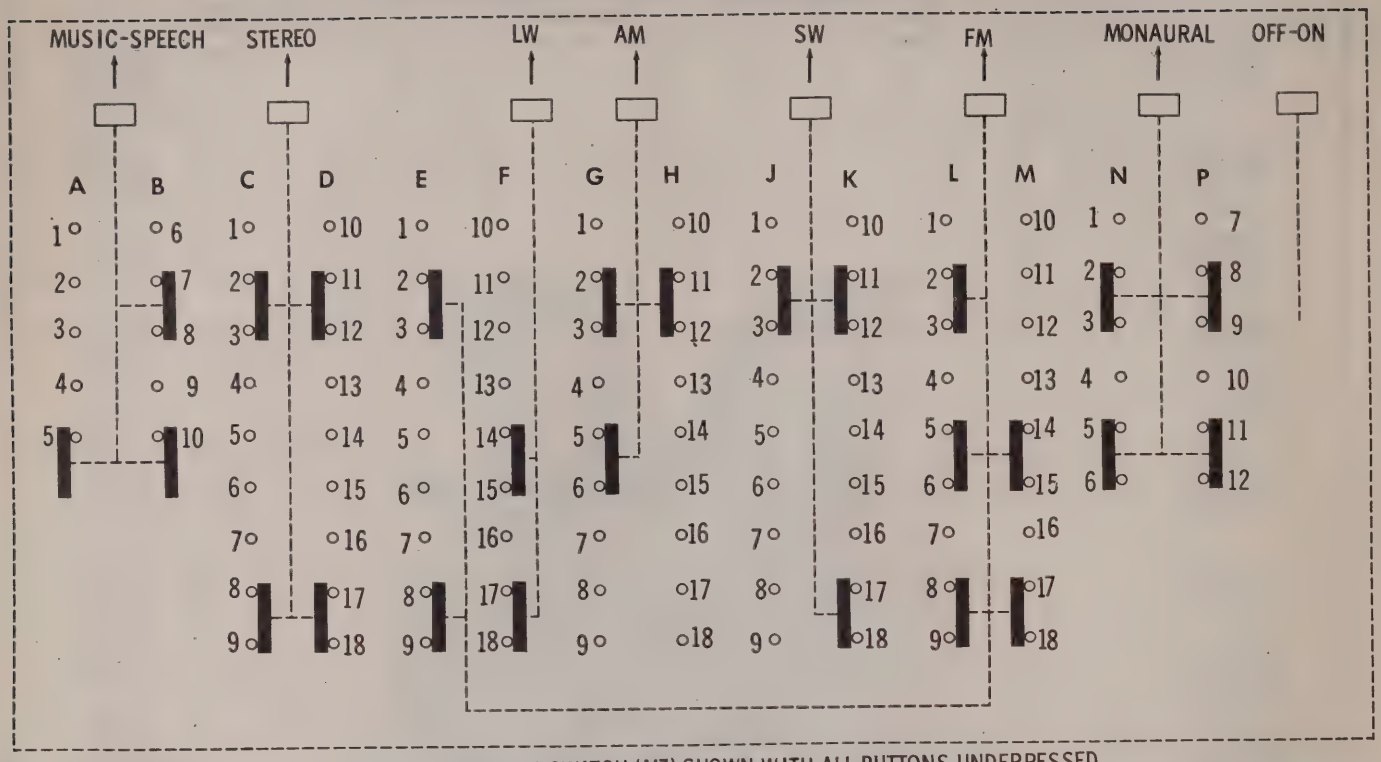


CHASSIS BOTTOM VIEW - RESISTOR & INDUCTOR IDENT.

SABA
MODEL 200-90C

FOLDER 12

PUSHBUTTON ASSEMBLY



FUNCTION SWITCH (M7) SHOWN WITH ALL BUTTONS UNDEPRESSED

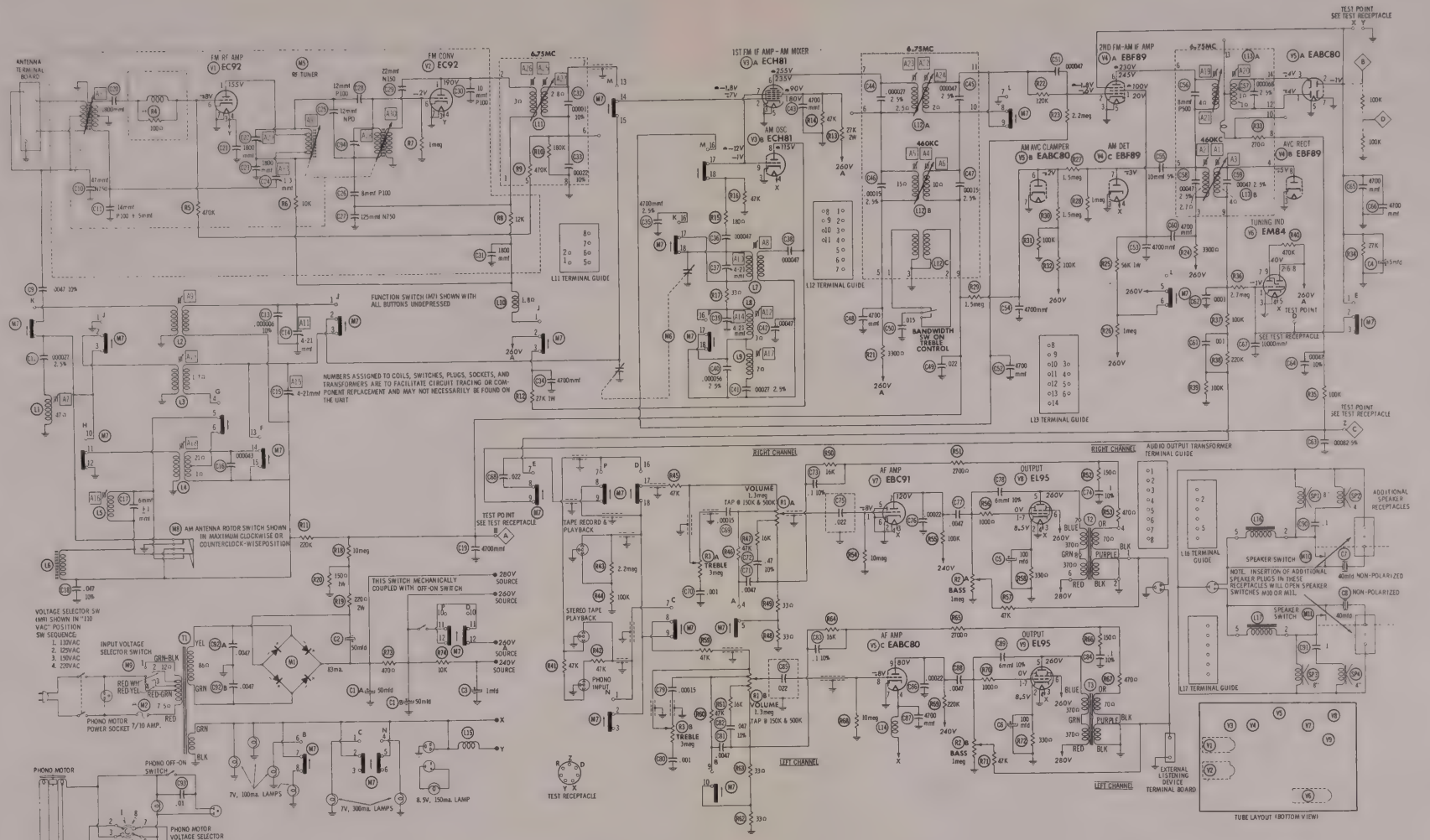
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	EC92	†10K	0Ω	0Ω	.1Ω	0Ω	1.1meg	0Ω		
V2	EC92	†12K	0Ω	0Ω	.1Ω	0Ω	1meg	0Ω		
V3	ECH81	†25K	180K ▲3meg	0Ω	.1Ω	0Ω	†3800Ω	3meg ▲47K	†▲27K	3meg ▲47K
V4	EBF89	† 1meg ▲†56K	120K ▲2.7meg	0Ω	.1Ω	0Ω	†3800Ω	900K	430K	27K
V5	EABC80	INF	27K	INF	.1Ω	0Ω	900K ▲1.8meg	0Ω	10meg	† 230K
V6	EM84	27K ▲3.1meg	†470Ω	0Ω	0Ω	.1Ω	†470Ω	†470K	†470Ω	†470K
V7	EBC91	10meg	0Ω	.1Ω	0Ω	0Ω	0Ω	†110K		
V8	EL95	450K	330Ω	.1Ω	0Ω	†740Ω	†470Ω	450K		
V9	EL95	450K	330Ω	.1Ω	0Ω	†740Ω	†470Ω	450K		

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.

† MEASURED FROM OUTPUT OF M1.

▲ MEASURED IN "AM" POSITION.


ANTENNA TERMINAL BOARD
FM RF AMP V1 EC92
RF TUNER
FM CONV V2 EC92
6.75MC
1ST FM IF AMP - AM MIXER V3A ECH81
AM OSC V3B ECH81
2ND FM-AM IF AMP V4A EBF89
AM AVC CLAMPER V5B EABC80
AM DET V4C EBF89
AVC RECT V4B EBF89
TUNING IND V6 EM84
AF AMP V7 EBC91
OUTPUT V8 EL95
AF AMP V5C EABC80
OUTPUT V9 EL95
460KC
L11 TERMINAL GUIDE
L12 TERMINAL GUIDE
L13 TERMINAL GUIDE
L16 TERMINAL GUIDE
L17 TERMINAL GUIDE
FUNCTION SWITCH (M7) SHOWN WITH ALL BUTTONS UNDEPRESSED
NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT
BANDWIDTH SW ON TREBLE CONTROL
TEST POINT SEE TEST RECEPTACLE
SEE TEST RECEPTACLE
AM ANTENNA ROTOR SWITCH SHOWN IN MAXIMUM CLOCKWISE OR COUNTERCLOCK-WISE POSITION
VOLTAGE SELECTOR SW (M9) SHOWN IN "110 VAC" POSITION
SW SEQUENCE:
1. 110VAC
2. 125VAC
3. 150VAC
4. 220VAC
INPUT VOLTAGE SELECTOR SWITCH
PHONO MOTOR POWER SOCKET 7/10 AMP.
THIS SWITCH MECHANICALLY COUPLED WITH OFF-ON SWITCH
280V SOURCE
260V SOURCE
240V SOURCE
TAPE RECORD & PLAYBACK
STEREO TAPE PLAYBACK
PHONO INPUT
VOLUME 1.3meg TAP @ 150K & 500K
TREBLE 3meg
BASS 1meg
RIGHT CHANNEL
LEFT CHANNEL
AUDIO OUTPUT TRANSFORMER TERMINAL GUIDE
EXTERNAL LISTENING DEVICE TERMINAL BOARD
SPEAKER SWITCH
ADDITIONAL SPEAKER RECEPTACLES
NOTE. INSERTION OF ADDITIONAL SPEAKER PLUGS IN THESE RECEPTACLES WILL OPEN SPEAKER SWITCHES M10 OR M11.
TUBE LAYOUT (BOTTOM VIEW)
TEST RECEPTACLE
PHONO MOTOR
PHONO OFF-ON SWITCH
PHONO MOTOR VOLTAGE SELECTOR SWITCH SHOWN IN "110V-125V" POSITION
SW SEQUENCE:
1. 110V-125V
2. 150V-160V
3. 220V-240V
7V, 100ma. LAMPS
7V, 300ma. LAMPS
8.5V, 150ma. LAMP

⊕ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±5% in voltage and resistance readings
6. Volume control at maximum, no signal applied for voltage measurements

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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SABA MODELS 200-90C, 200-90T

ALIGNMENT INSTRUCTIONS

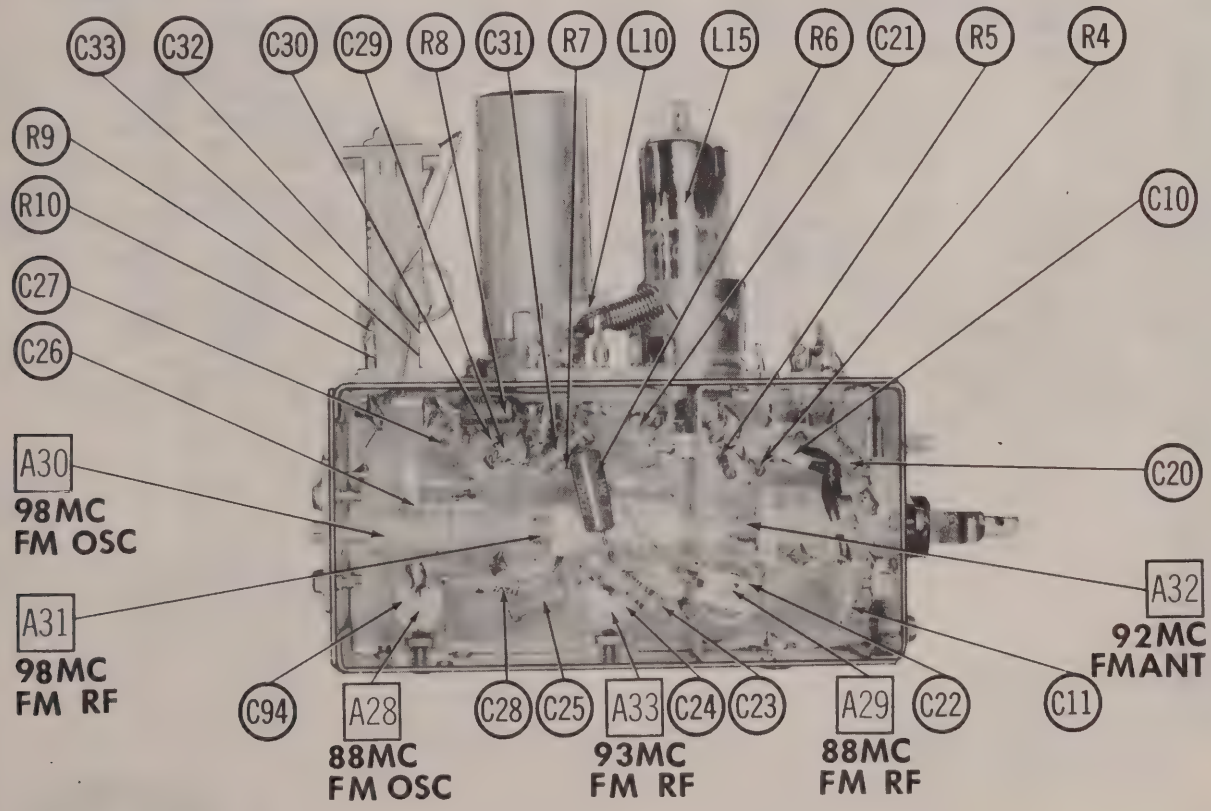
ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.
Suggested alignment tools: A1 thru A9, A12, A13, A16 thru A27, A33.....GENERAL CEMENT #8282, 8606, 8606L, 9091
WALSCO #2526, 2541, 2543, 2544
A10, A11, A14, A15, A28, A29.....GENERAL CEMENT #5097, 8727
WALSCO #2515

AM ALIGNMENT

Connect the negative lead of a 4.5 volt bias supply to point Ⓐ. Positive to chassis. Connect speaker during alignment. Set Treble control fully counterclockwise.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	10000mmf	High side to pin 1 (screen) of AM Mixer. Low side to chassis.	460KC (400∿ 30% AM)	AM	High end stop.	Across voice coil.	A1, A2, A3	Detune A3 SLIGHTLY. Adjust A1 and A2 for maximum output. Adjust A3 for maximum output.
2.	"	"	"	"	"	"	A4, A5, A6	Detune A6 SLIGHTLY. Adjust A4, and A5 for maximum output. Adjust A6 for maximum, then turn counterclockwise until meter reading decreases 5%.
3.	200mmf and 400Ω in series.	Across AM antenna plug with 200mmf and 400Ω in series with high side.	"	"	"	"	A7	Adjust for MINIMUM output.
4.	"	Across antenna plug with 200mmf and 400Ω in series with high side. (Rotary Antenna turned to "AUS".)	7.2MC	SW	7.2MC	"	A8, A9	Adjust for maximum output.
5.	"	"	15.2MC	"	15.2MC	"	A10, A11	"
6.		Loop (Rotary Antenna turned on)	570KC	AM	570KC	"	A12, A13	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
7.		"	1520KC	"	1520KC	"	A14, A15	Adjust for maximum output. Repeat Steps 6 and 7 if necessary.
8.	200mmf and 400Ω in series.	Across AM antenna plug with 200mmf and 400Ω in series with high side.	570KC	"	570KC	"	A16	Adjust for maximum output.
9.	"	"	190KC	LW	190KC	"	A17, A18	"



FM RF SUB CHASSIS

SET 472 FOLDER 12

SABA MODELS 200-90C, 200-90T

FOLDER 12

ALIGNMENT INSTRUCTIONS (cont)

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100K (±1%) resistors in series from point Ⓑ to chassis. The junction of these two resistors is alignment point Ⓓ as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
10	1000mmf Ceramic Capacitor	High side to pin 6 (grid) of FM Converter. Low side to chassis.	6.75MC (Unmod.)	FM	92MC	DC probe to point Ⓑ. Common to chassis.	A19	Detune A21 by turning counterclockwise. Adjust A19 for maximum deflection.
11.	"	"	"	"	"	DC probe to point Ⓒ. Common to point Ⓓ.	A20	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
12.	"	"	"	"	"	DC probe to point Ⓑ. Common to chassis.	A21	Adjust for maximum deflection.
13.	"	"	"	"	"	"	A22, A23, A24	Detune A24, by turning counterclockwise. Adjust A22, A23 and A24 in order for maximum deflection.
14.	"	"	"	"	"	"	A25, A26, A27	Detune A27 by turning counterclockwise. Adjust A25, A26, And A27 in order for maximum deflection.
15.	"	"	"	"	"	"		Readjust A21 for MINIMUM deflection. Voltage should be approximately 10 volts. Repeat Steps 10 and 11.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
10.	1000mmf Ceramic Capacitor.	High side to pin 6 (grid) of FM Converter. Low side to chassis.	6.75MC (450KC Swp.)	FM	Point of non-interference.	Vert. amp. to point Ⓑ. Low side to chassis.	A19	Disconnect stabilizing capacitor C4. Detune A21 by turning counterclockwise. Adjust A19 for maximum amplitude and symmetry of response similar to Fig. 1. Reconnect C4.
11.	"	"	"	"	"	Vert. amp. to point Ⓒ. Low side to chassis.	A20	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A19 for maximum amplitude and straightness of crossover lines.
12.	"	"	"	"	"	Vert. amp. to point Ⓑ. Low side to chassis.	A21	Disconnect C4. Adjust A21 for maximum gain and symmetry of response similar to Fig. 1.
13.	"	"	"	"	"	"	A22, A23, A24	Detune A24 by turning counterclockwise. Adjust A22, A23, And A24 in order for maximum gain and symmetry.
14.	"	"	"	"	"	"	A25, A26, A27	Detune A27 by turning counterclockwise. Adjust A25, A26 and A27 in order for maximum gain and symmetry.
15.	"	"	"	"	"	"		Readjust A21 for MINIMUM response. Repeat Steps 10 and 11 if necessary. If not, reconnect C4.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
16.		Across FM antenna terminals.	88MC (Unmod.)	FM	88MC	DC probe to point Ⓑ. Common to chassis.	A28, A29	Adjust for maximum deflection.
17.		"	98MC	"	98MC	"	FM tuning adjust-ment	"
18.		"	"	"	"	"	A30, A31	"
19.		"	92MC	"	92MC	"	A32	"
20		"	93MC	"	93MC	"	A33	Disconnect plate voltage from FM RF Amp. Increase signal generator output to approximately .5MV. Adjust A 33 for MINIMUM deflection. Reconnect plate voltage. Repeat Steps 16 and 19.

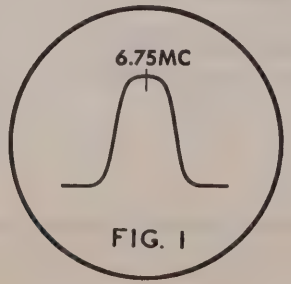


FIG. 1

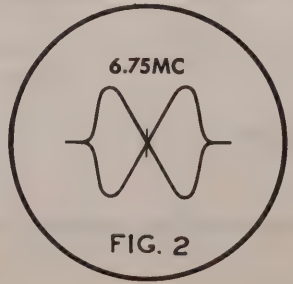
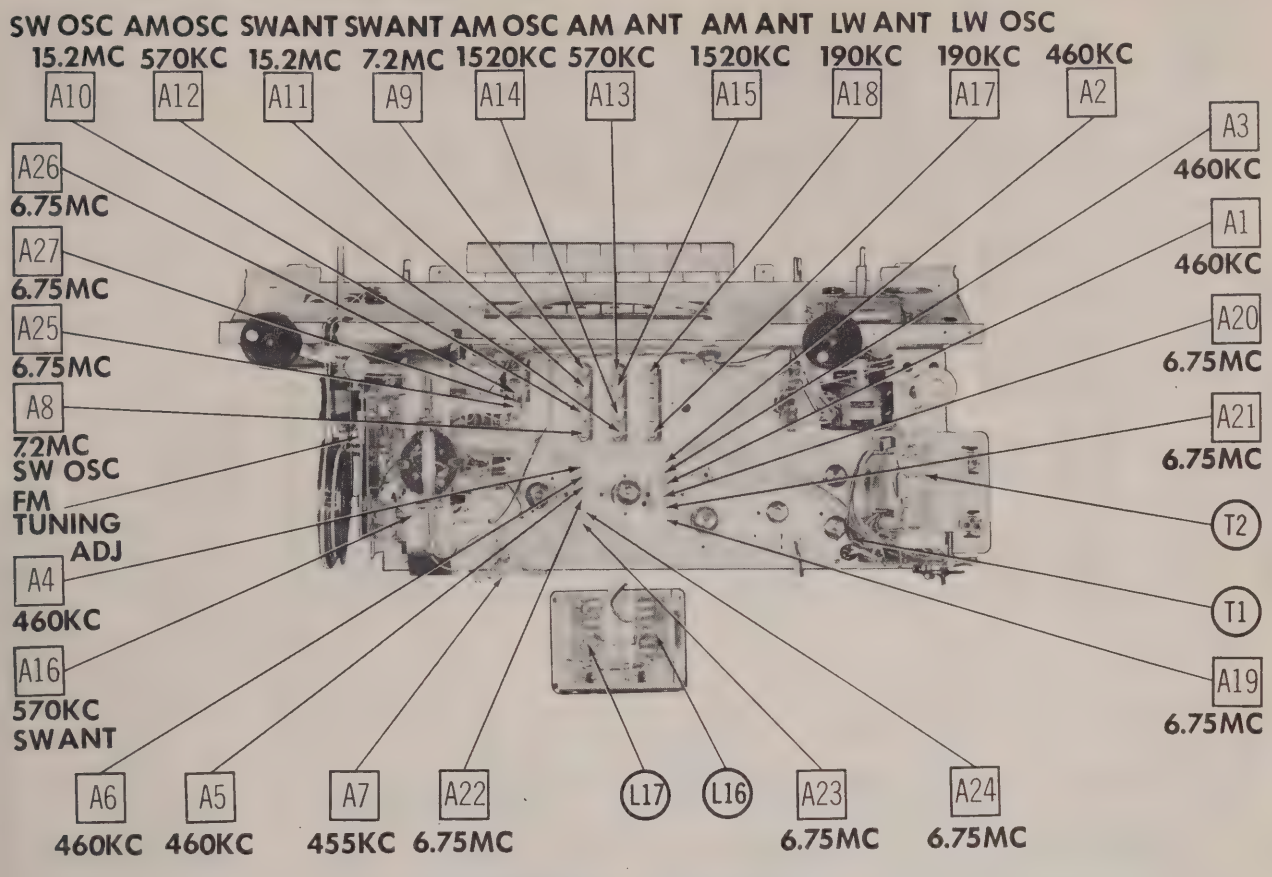
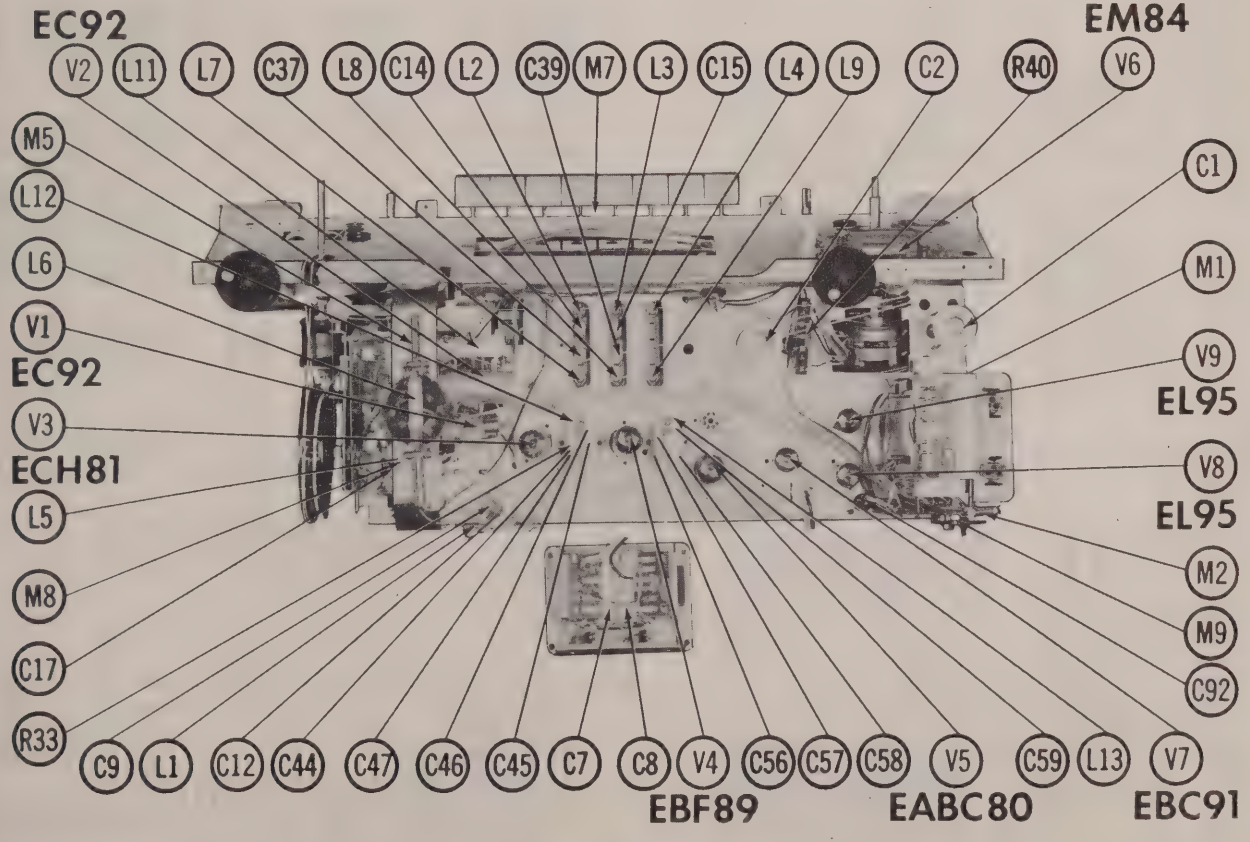


FIG. 2



CHASSIS - TOP VIEW



CHASSIS - TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES

• CBS • GENERAL ELECTRIC • RAYTHEON • SYLVANIA •

ITEM No.	USE	TYPE
V1	FM RF Amplifier	EC92
V2	FM Converter	EC92
V3	1st FM IF Amplifier - AM Mixer - AM Osc.	ECH81
V4	2nd FM-1st AM IF Amp. - AM Det. - AVC Rect.	EBF89
V5	Ratio Detector - AM AVC Clamper - Right Channel AF Amp.	EABC80
V6	Tuning Indicator	EM84
V7	Left Channel AF Amp.	EBC91
V8	Left Channel Output	EL95
V9	Right Channel Output	EL95

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA SABA PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	50	350		PRS2420	BBRD4445	TCD78	TDLD-32	R2462	
B	50	350							
C2	50	350		PRS1680	BR5035	TC79	TD-50-450	TVA-1713	
C3	1	350		PRS1700	BR145	TC595	TD-2-450	TVA-1701	
C4	5	70		SRE150V5	NLW5-100	TT150X5	TD-8-150	TE-1404	
C5	100	12		SRE12V100	BBR100-15	TT15X100	ML100-15	TE-1135	
C6	100	12		SRE12V100	BBR100-15	TT15X100	ML100-15	TE-1135	
C7	40	100NP		NP-PRS7450				TVAS-1340 *	
C8	40	100NP		NP-PRS7450				TVAS-1340 *	

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C9	.0047 500V 10%		V84C6D47-10%		PM6D47	6DP-1-472	GP247	6TM-D47
C10	47 N750		N750-SI 47	TCN-47	C10Q47U	CCTO-471	CN7-447	10TCU-Q47
C11	14 P100 ±.5mmf					CM-15-E-270G		
C12	.000027 125V 2.5%							
C13	.000006 125V 10%			DD-060	C10V6C			10TS-V60
C14	4-21							
C15	4-21							
C16	.000043 125V			TCZ-43	C10Q430	CM-20B-430M		
C17	6 ±1mmf		NPO-SI 6.8	DD-060	C10V6C	CCTO-6R8	GP568	10TS-V60
C18	.047 125V 10%		V84C2S47-10%		PM2S47	4DP-3-473	GEM-1615	2TM-S47
C19	4700		SI 4700	D6-472	BYA10D47	CCD-472	UC-5247	5HK-D47
C20	1800		SI 1800	D6-182	L10D18	CCD-182	UC-5218	5GA-D18
C21	1800		SI 1800	D6-182	L10D18	CCD-182	UC-5218	5GA-D18
C22								
C23	1800		SI 1800	D6-182	L10D18	CCD-182	UC-5218	5GA-D18
C24	1-3							
C25	12 NPO		NPO-SI 12	TCZ-12	C10Q12C	CCTO-120	CNO-412	10TCC-Q12
C26	8 P100							
C27	125 N750		N750-SI 130	TCN-130	C10T13U	CCTN-151		10TCU-T12
C28	12 P100							
C29	22 N150					*		10TCP-Q22
C30	10 P100							
C31	1800		SI 1800	D6-182	L10D18	CCD-182	UC-5218	5GA-D18
C32	.00001 125V 10%			DD-100	L10Q1	CCD-100	GP410	10TS-Q10
C33	.00022 125V 10%			DD-221	L10T22	CCD-221	GP322	10TS-T22
C34	4700		SI 4700	D6-472	BYA10D47	CCD-472	UC-5247	5HK-D47
C35	4700 2.5%					DM-20-472G		
C36	.000047 125V			DD-470	L10Q47	CCD-470	CNO-447	5GA-Q47
C37	4-21							
C38	.00047 125V			DD-471	BYA10T47	CCD-471	GP347	5GA-T47
C39	4-21							
C40	.000056 125V 2.5%					DM-15-560G		
C41	.00027 125V 2.5%					DM-15-271G		
C42	.00047 125V			DD-471	BYA10T47	CCD-471	GP347	5GA-T47

FIXED CAPACITORS (cont)

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C43	4700		SI 4700	D6-472	BYA10D47	CCD-472	UC-5247	5HK-D47
C44	.000027 125V 2.5%					DM-15-270G		
C45	.000047 125V 2.5%					DM-15-470G		
C46	.00015 2.5%					DM-15-151G		
C47	.00015 2.5%					DM-15-151G		
C48	4700		SI 4700	D6-472	BYA10D47	CCD-472	UC-5247	5HK-D47
C49	.022 100V		P288N-022		CUB4S22	1DP-1-223	GEM-4122	4TM-S22
C50	.015 125V		P288N-015	DD16-153	CUB6S15	4DP-1-153	GEM-4115	4TM-S15
C51	.000047 125V				L10Q47	CCD-470	CNO-415	5GA-Q47
C52	4700		SI 4700	D6-472	BYA10D47	CCD-472	UC-5247	5HK-D47
C53	4700		SI 4700	D6-472	BYA10D47	CCD-472	UC-5247	5HK-D47
C54	4700		SI 4700	D6-472	BYA10D47	CCD-472	UC-5247	5HK-D47
C55	10 5%		NPO-SI 10	TCZ-10	C10Q1C	CM-20B-100K	CNO-410	10TCC-Q10
C56	8 P500							
C57	.000068 125V 2.5%					DM-15-680G		
C58	.00047 125V 2.5%					DM-15-471G		
C59	.00047 125V 2.5%					DM-15-471G		
C60	4700		SI 4700	D6-472	BYA10D47	CCD-472	UC-5247	5HK-D47
C61	.001 125V		P288N-001	DD-102	CUB6D1	CCD-102	GEM-421	6TM-D1
C62	.0001 125V		P688N-0001	DD-101	CUB6T1	CCD-101	UC-531	6TM-T1
C63	.00082 125V 5%				1R5T82	CM-20B-821J		MS-382
C64	.00047 125V 10%			DD-471	5R5T47	CCS-471	MCJ244	10TS-T47
C65	4700		SI 4700	D6-472	BYA10D47	CCD-472	UC-5247	5HK-D47
C66	4700		SI 4700	D6-472	BYA10D47	CCD-472	UC-5247	5HK-D47
C67	10000		SI 10000	D6-103	BYA10S1	CCD-103	B-110	5HK-S10
C68	.022 125V		P288N-022		CUB4S22	4DP-2-223	GEM-4122	4TM-S22
C69	.00015 125V				L10T15	CCD-151	GP315	5GA-T15
C70	.001 125V		P288N-001	DD-102	CUB6D1	CCD-102	GP210	6TM-D1
C71	.0047 125V		P288N-0047	DD-472	CUB6D47	CCD-472	GEM-6247	6TM-D47
C72	.047 125V 10%		V84C2S47-10%		PM2S47	4DP-3-473	GEM-1615	2TM-S47
C73	.1 125V 10%		V84C2P1-10%		PM2P1	2DP-3-104	GEM-201	2TM-P1
C74	.1 125V 10%		V84C2P1-10%		PM2P1	2DP-3-104	GEM-201	2TM-P1
C75	.022 125V Special							
C76	.00022 125V			DD-221	L10T22	CCD-221	GP322	5GA-T22
C77	.0047 500V		P688N-0047	D6-472	BYA10D47	6DP-1-472	GEM-6247	6TM-D47
C78	6 10%		NPO-SI 6.8	TCZ-6R8	C10V6C	CCTO-6R8		10TS-V60
C79	.00015 125V				L10T15	CCD-151	GP315	5GA-T15
C80	.001 125V		P288N-001	DD-102	CUB6D1	CCD-102	GEM-421	6TM-D1
C81	.0047 125V		P288N-0047	DD-472	CUB6D47	CCD-472	GEM-6247	6TM-D47
C82	.047 125V 10%		V84C2S47-10%		PM2S47	4DP-3-473	GEM-1615	2TM-S47
C83	.1 125V 10%		V84C2P1-10%		PM2P1	2DP-3-104	GEM-201	2TM-P1
C84	.1 125V 10%		V84C2P1-10%		PM2P1	2DP-3-104	GEM-201	2TM-P1
C85	.022 125V Special							
C86	.00022 125V			DD-221	L10T22	CCD-221	GP322	5GA-T22
C87	4700		SI 4700	D6-472	BYA10D47	CCD-472	UC-5247	5HK-D47
C88	.0047 500V		P688N-0047	DD-472	CUB6D47	CCD-472	GEM-6247	6TM-D47
C89	6 10%		NPO-SI 6.8	TCZ-6R8	C10V6C	CCTO-6R8		10TS-V60
C90	.1 125V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C91	.1 125V		P288N-1	DF-104	CUB2P1	2DP-3-104	GEM-201	2TM-P1
C92A	.0047 500V		P688N-0047	DD2-502	BYC6DD47	CCD-472	B2X250	5HK-2D47
B	.0047 500V		P688N-0047			CCD-472		
C93	.01 250V		P488N-01	DD-103	CUB4S1	4DP-1-103	GEM-411	4TM-S1
C94								

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SABA PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1.3meg*	1/2	5807-000-554					
B	1.3meg*	1/2						Volume, Right Channel
R2A	1meg	1/2	2X1M-F 428					Volume, Left Channel
B	1meg	1/2						Bass, Right Channel
R3A	3meg	1/2						Bass, Left Channel
B	3meg	1/2						Treble, Right Channel
C	Switch							Treble, Left Channel
								Band width

* Taps @ 150K and 500K.

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R4	100Ω	Note 1
R5	470K	
R6	10K	
R7	1meg	
R8	12K	
R9	470K	
R10	180K	
R11	220K	
R12	27K 1W	
R13	27K 2W	
R14	47K	
R15	180Ω	
R16	47K	
R17	33Ω	
R18	10meg	
R19	220Ω 2W	
R20	150Ω 1W	
R21	3300Ω	
R22	120K	
R23	2.2meg	
R24	3300Ω	
R25	56K 1W	
R26	1meg	
R27	1.5meg	

ITEM No.	RATING	REMARKS
R28	1meg	
R29	1.5meg	
R30	1.5meg	
R31	100K	
R32	100K	
R33	270Ω	
R34	27K	
R35	100K	
R36	2.7meg	
R37	100K	
R38	220K	
R39	100K	
R40	470K	
R41	47K	
R42	47K	
R43	2.2meg	
R44	100K	
R45	47K	
R46	47K	
R47	16K	
R48	33Ω	
R49	33Ω	
R50	16K	
R51	2700Ω	

ITEM No.	RATING	REMARKS
R52	150Ω	
R53	470Ω	
R54	10meg	
R55	100K	
R56	1000Ω	
R57	47K	
R58	330Ω	
R59	47K	
R60	47K	
R61	16K	
R62	33Ω	
R63	33Ω	
R64	16K	
R65	2700Ω	
R66	150Ω	
R67	470Ω	
R68	10meg	
R69	220K	
R70	1000Ω	
R71	47K	
R72	330Ω	
R73	470Ω	
R74	10K	

Note 1. Two turns of wire wound on resistor.

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	SABA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	220V Taps ⓐ 150V, 125V, 117V ⓐ .58A	250V ⓐ .080A	6.3V ⓐ 3A	3818-101-111						

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.1	SEC.1	SABA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	4000Ω	2.5Ω	3816-404-111							
	PRI. 2	SEC. 2								
	4000Ω	200Ω								
T3	PRI. 1	SEC. 1	3816-404-111							
	4000Ω	2.5Ω								
	PRI. 2	SEC. 2								
	4000Ω	200Ω								

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SABA PART No.	QUAM PART No.	
SP1	8"	PM	4-5Ω	5898410002①		① Channel 1 speaker parallel & phase
SP2	4"	PM	4-5Ω	5898010003①		② Channel 2 speaker parallel & phase
SP3	8"	PM	4-5Ω	5898410002②		
SP4	4"	PM	4-5Ω	5898010003②		

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		SABA PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	LW Ant. Coil							
L2	SW Ant. Trans.							
L3	AM Ant. Trans.							
L4	LW Ant. Trans.							
L5	SW Ant. Coil							
L6	Loopstick							
L7	SW Osc. Coil							
L8	AM Osc. Coil							
L9	LW Osc. Coil							
L10	RF Choke							
L11	1st FM IF Trans.							
L12A	2nd FM IF Trans.							
B	1st AM IF Trans.							
C	Band Width Coil							
L13A	Ratio Detector							
B	2nd AM IF Trans.							
L14	Fil. Choke		19-1000	19-1000	BC-561	4602		1uh
L15	Fil. Choke		19-1000	19-1000	BC-561	4602		1uh

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	SABA PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.083A	B250 C100①					① Selenium Type

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			SABA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2		7/10A 250V① 4/10A 250V②						

① Used when AC input is 110-150VAC.
② Used when AC input is 220V.

CROSSOVER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA						
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ∿)	SABA PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L16		.4Ω	.006HY	5890-115-004						
L17		.4Ω	.006HY	5890-115-004						

PARTS LIST AND DESCRIPTIONS (Continued)

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA							
	SABA PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M3	KS2								

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	SABA PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	
M4	1004-DS † ♦			† Jewel ♦ Diamond

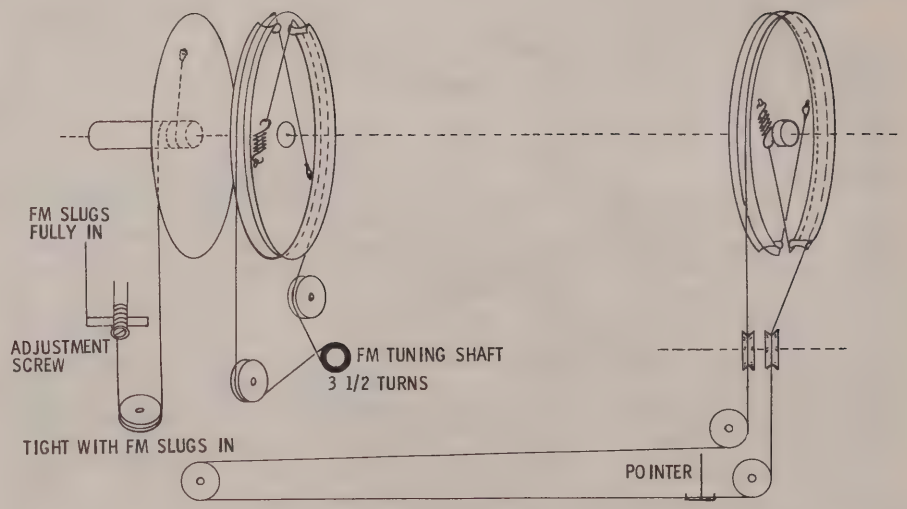
MISCELLANEOUS

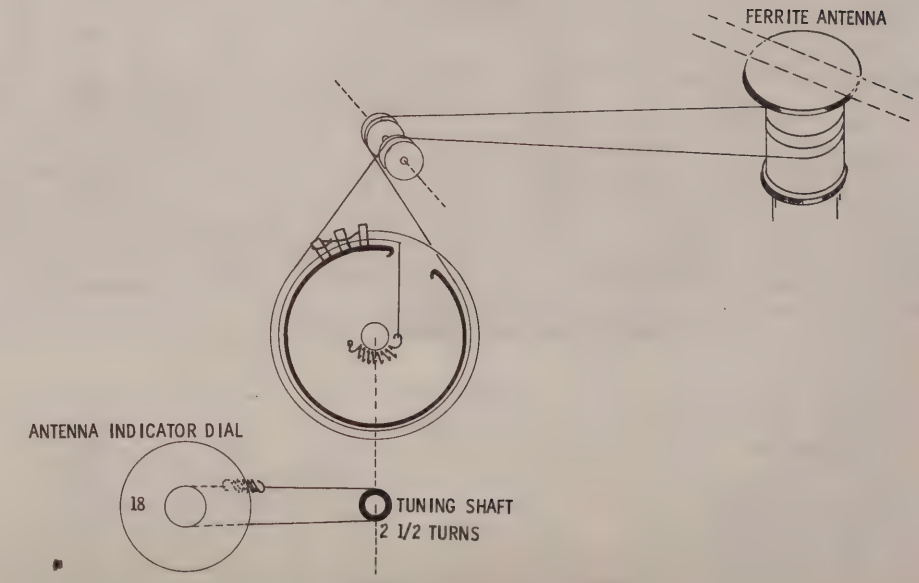
ITEM No.	PART NAME	SABA PART No.	NOTES
M5	RF Tuner		Complete
M6	Tuning Cap.		2 Gang
M7	Switch		Function, Pushbutton Type, Complete, Includes Music, Stereo, LW, AM, SW, FM, Mono, Off-On
M8	Switch		Antenna
M9	Switch		Input Voltage Selector
M10	Switch		Speaker, Channel 1
M11	Switch		Speaker, Channel 2

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

DIAL CORD STRINGING





PHOTOFACT® Folder

SILVERTONE MODELS 51,
53 (Ch. 528.53540, 528.53780)

MODEL 51

SILVERTONE MODELS 51,
53 (Ch. 528.53540, 528.53780)

TRADE NAME	Silvertone Models 51 (Ch. 528.53540), 53 (Ch. 528.53780)
SUPPLIER	Sears, Roebuck & Co., 925 S. Homan Ave., Chicago, Illinois
TYPE SET	AC Operated 5 Tube AM Receiver With Stereo Record Player
POWER SUPPLY	110-120 Volts AC, 60 Cycles
RATING	31 Watts, .36 Amp. @117 Volts AC
TUNING RANGE—BROADCAST	532 — 1630KC

MODEL 51 HAS AUTOMATIC 16-45 RPM AND MANUAL 33-RPM RECORD PLAYER 528.57210
MODEL 53 HAS 4 SPEED AUTOMATIC RECORD CHANGER 528.56662 OR 528.56663

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1mfd capacitor in series with low side of signal generator. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested alignment tools:

A1 thru A4.....	GENERAL CEMENT #5009, 8195, 8274, 8275, 8728, 8987 WALSCO #2531
A5, A7.....	GENERAL CEMENT #5004, 5008, 5009 WALSCO #2520
A6.....	GENERAL CEMENT #8606, 8606L, 8282, 9295 WALSCO #2526, 2543, 2544, 2545

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to pin 7 (grid) of Converter. Low side to chassis.	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output.
2.	"	"	1630KC	"	"	A5	"
3.	"	"	532KC	Tuning gang fully closed.	"	A6	Adjust for maximum output. Repeat Steps 2 and 3.
4.	"	"	1400KC	Tune to 1400KC signal.	"	A7	Adjust for maximum output while rocking tuning gang.

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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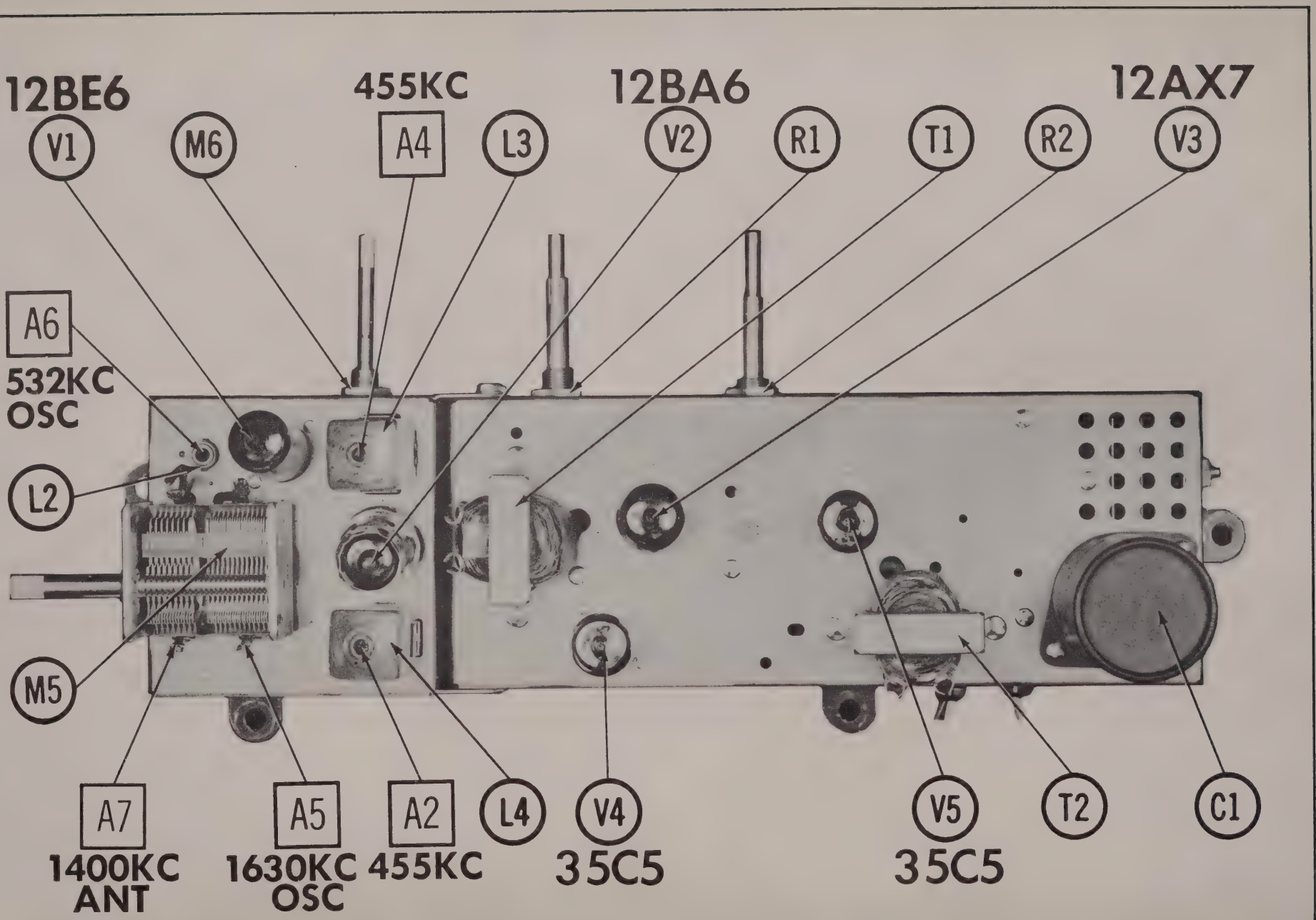
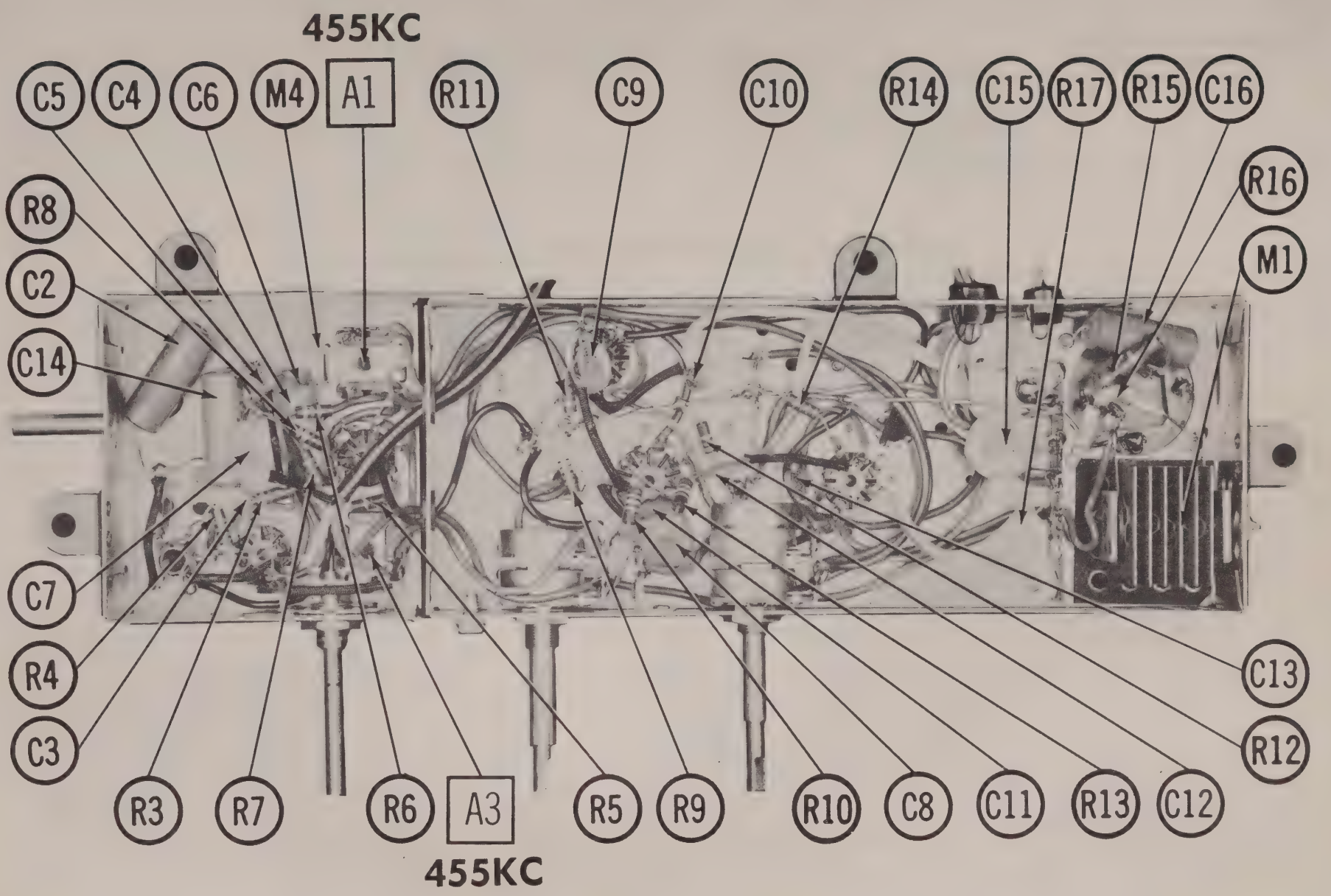
SET 472 FOLDER 13



CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V1	Converter	12BE6
V2	IF Amplifier	12BA6
V3	Left Channel AF Amp. - Right Channel AF Amp.	12AX7
V4	Left Channel Output	35C5
V5	Right Channel Output	35C5

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Silvertone PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	2meg	1/2	24-346-0					Loudness, Left Channel
B	2meg	1/2						Loudness, Right Channel
R2A	500K	1/2	24-196-2	AB-613	AD47-500K-S			Tone, Left Channel
B	500K	1/2		SR-613	Not Req.			Tone, Right Channel
C	Shaft			AK-8	RS-3/16			
D	Switch			KR-1	SWE-12			Power, Off-On

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	▲150	150	18-48-3	AFH3-26	B0608	FP117.5	TMD-20	TVL-2443.3	
B	▲50	150				TC49			

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R3	2.2meg	
R4	22K	
R5	150Ω	
R6	47K	
R7	2.2meg	

ITEM No.	RATING	REMARKS
R8	220K	
R9	4.7meg	
R10	270K	
R11	220Ω	
R12	4.7meg	

ITEM No.	RATING	REMARKS
R13	270K	
R14	220Ω	
R15	1000Ω 1W	
R16	27Ω 2W	
R17	80Ω 4W	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	.047 400V	(150mmf) *	P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C3	470 10%		DI-470	DD-471	5R5T47	CCD-471	GP347	10TS-T47
C4	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C5	150 10%		DI-150	DD-151	L10T15	CCD-151	GP315	10TS-T15
C6	150 10%		DI-150	DD-151	L10T15	CCD-151	GP315	10TS-T15
C7	5000 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C8	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C9	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C10	330 10%		DI-330	DD-331	L10T33	CCD-331	GP333	10TS-T33
C11	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-120	5HK-S20
C12	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C13	330 10%		DI-330	DD-331	L10T33	CCD-331	GP333	10TS-T33
C14	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C15	20000		BPD-02	DD-203	BYB6S2	CCD-203	B-110	5HK-S20
C16	.047 400V		P488N-047	DD-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47

* Alternate Value

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		SILVERTONE PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loopstick	82-122-0 ①						
L2	Osc. Coil	10-50-4			BC-393			
L3	Input IF	10-108-2	16-6758	16-6758	BC-352	12-C1	RF-1	
L4	Output IF	10-110-2	16-6758	16-6758	BC-353	12-C2	RF-2	

① Chassis 528.53780 Uses Part #82-155-0 in this application.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2600Ω	6-8Ω	80-97-1	22S86 ①	A-2902①	AU-604①	A-3849①	22S86①		① Drill New Mounting Hole.
T2	2600Ω	6-8Ω	80-97-1	22S86①	A-2902①	AU-604①	A-3849①	22S86①		

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SILVERTONE PART No.	QUAM PART No.	
SP1	4"	PM	6-8Ω	33-406-4①	4A1Z7.8	① Model 51
SP2	4"	PM	6-8Ω	33-406-4①	4A1Z7.8	② Model 53
	5"	PM		33-415-4②		

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					
	CURRENT (Measured)	SILVERTONE PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.047A	① 86-15-3	① RS150	①1235AH	① 150	② SR200	① Selenium Type ② Silicon Type

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA								
	SILVERTONE PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M2	33-319-0①	13TB *	Not Req.	66 ǂ	Not Req			N10T2-S	Not Req.
	33-311-0②	13TB *	Not Req.	26S	Not Req			10T2-S *	Not Req.

① Model 51, includes needles.
② Model 53.

* Includes Mount.
ǂ Use Mount PT-3.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	SILVERTONE PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	
M3	① 83-1252 † (LP)	W-101STS † or W-101STD ♦	E98X † or E98XD †♦	† Jewel ♦ Diamond ① Model 53
	①83-125-0 (78 RPM)	W-102MGS † or W-102MGD ♦	E98 † or E98D ♦	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA				NOTES
		SILVERTONE PART No.	CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
M4	CTP461		1N60	1N60	1N295	Detector (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M5	Tuning Cap	19-79-2	2 Gang, Chassis 528.53540 Ant. 25-353mmf, Osc. 16-117mmf
	Tuning Cap	19-78-2	2 Gang, Chassis 528.53780
M6	Switch	69-287-0	Function Selector
M7	Switch	69-251-0	Off-On (Part of Changer) Chassis 528.57210
	Switch	84-7838	Off-On (Part of Changer) Chassis 528.56662, 663
M8	Motor	59-138	Chassis 528.57210
	Motor	59-72	Complete, Chassis 528.56662
	Motor	59-89	Complete, Chassis 528.56663

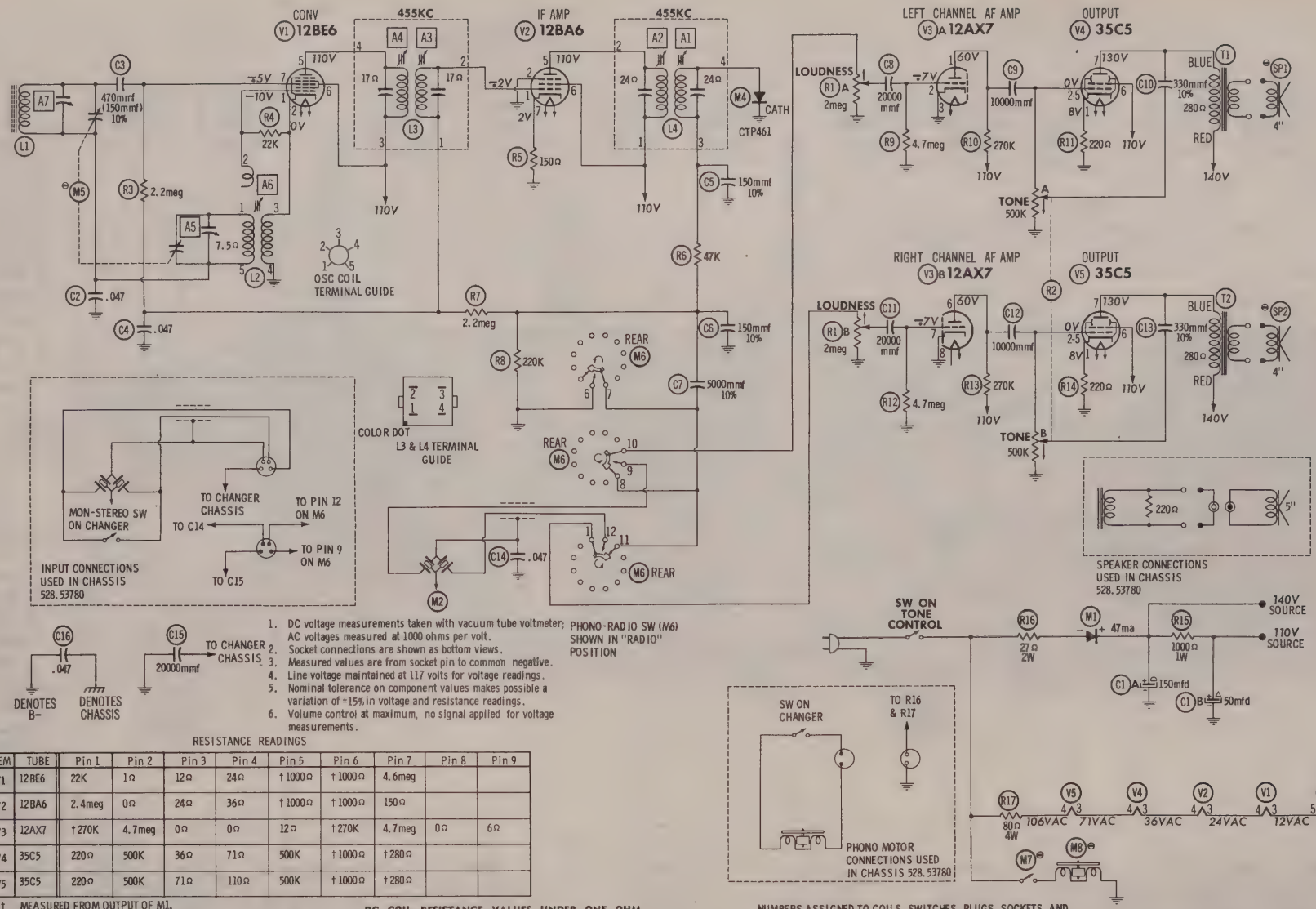
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	52-1217-0	Tuning, Model 51
Knob	52-1109-0	Tuning, Model 53
Knob	52-1266-0	Loudness, Model 51
Knob	52-1267-0	Loudness, Model 53
Knob	52-1240-0	Stereo Balance, Model 51
Knob	52-1245-0	Stereo Balance, Model 53
Knob	52-1144-0	Function, Off-On-Tone, Model 51, Off-On-Tone, Model 53
Knob	52-1132-0	Function, Model 53
Knob	52-771-0	Changer Controls, Model 51
Knob	52-1235-0	Off-On-Reject, Model 51
Knob	52-1238-0	Speed Control, Model 53
Dial Window	48-170-1	Model 53
Escutcheon	40-210-0	Model 53
Cabinet	42-110-3	Model 51
Cabinet	42-125-3	Model 53
Handle	49-472	Model 51
Handle	45-517	Model 53
Speaker Enclosure	21-115-1	Model 53
Speaker Enclosure	84-7568	Baffle, Cabinet Lid, Model 51

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PHONO-RADIO SW (M6) SHOWN IN "RADIO" POSITION

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12BE6	22K	1Ω	12Ω	24Ω	†1000Ω	†1000Ω	4.6meg		
V2	12BA6	2.4meg	0Ω	24Ω	36Ω	†1000Ω	†1000Ω	150Ω		
V3	12AX7	†270K	4.7meg	0Ω	0Ω	12Ω	†270K	4.7meg	0Ω	6Ω
V4	35C5	220Ω	500K	36Ω	71Ω	500K	†1000Ω	†280Ω		
V5	35C5	220Ω	500K	71Ω	110Ω	500K	†1000Ω	†280Ω		

† MEASURED FROM OUTPUT OF M1.
❸ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

SILVERTONE MODELS 51, 53 (Ch. 528.53540, 528.53780)

PHOTOFACT® Folder with CIRCUITRACE®

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

SILVERTONE MODELS 58, 59 (Ch. 528.53640, 528.59480)

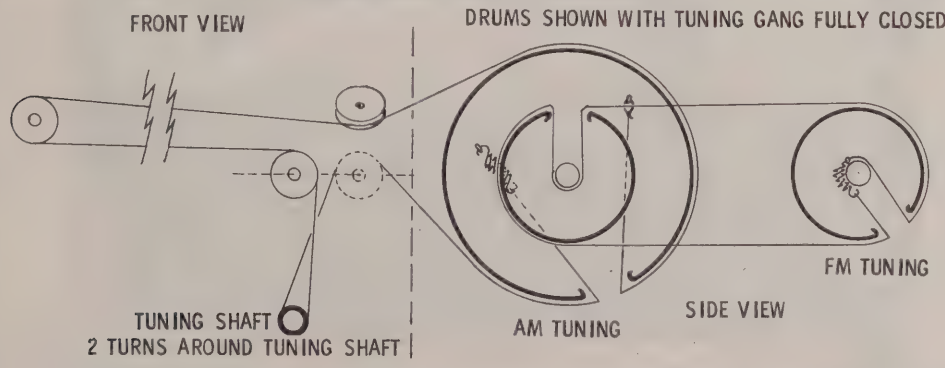
SILVERTONE MODELS 58, 59 (Ch. 528.53640, 528.59480)

MODEL 59

SILVERTONE MODELS 58, 59 (Ch. 528.53640, 528.59480)

TRADE NAME	Silvertone Models 58, 59 (Tuner Ch. 528.53640, Amp. Ch. 528.59480)		
SUPPLIER	Sears, Roebuck & Co., 925 S. Homan Ave., Chicago, Illinois		
TYPE SET	AC Operated 6 Tube FM-AM Tuner, 4 Tube Stereo Amplifier and 4 Speed Automatic Record Changer		
POWER SUPPLY	110-120 Volts AC, 60 Cycles	RATING	63 Watts, .66 Amp. @ 117 Volts AC
TUNING RANGE	BROADCAST 532 - 1630KC	FREQ. MOD.	88 - 108MC

FOR SERVICE INFORMATION ON RECORD CHANGER 528.56640 OR 528.56641 - SEE SIMILAR SILVERTONE 528.56100 - PHOTOFACT SET 417 FOLDER 10



DIAL CORD STRINGING

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of JN604

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RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6EZ8	82Ω	0Ω	†1350Ω	0Ω	.1Ω	†1350Ω	330K	†40K	8200Ω
V2	6AU6	1.5Ω	0Ω	.1Ω	0Ω	†1800Ω	†1800Ω	82Ω		
V3	6BE6	▪18K	▪1Ω	.1Ω	0Ω	†▪790Ω	†▪780Ω	▪2.7meg		
V4	6BA6	▪2.7meg 2.2meg	0Ω	.1Ω	0Ω	† 790Ω	† 780Ω	82Ω		
V5	6AU6	520K	0Ω	.1Ω	0Ω	†11K	†11K	82Ω		
V6	6AL5	INF	INF	.1Ω	0Ω	7800Ω	0Ω	8200Ω		
V7	7025	††295K	1meg	4700Ω	0Ω	11Ω	††295K	1meg	4700Ω	6Ω
V8	7025	††270K	560K	2700Ω	11Ω	20Ω	††270K	560K	2700Ω	15Ω
V9	50C5	150Ω	470K	20Ω	42Ω	470K	††2700Ω	††270Ω		
V10	50C5	150Ω	470K	42Ω	15Ω	470K	††2700Ω	††270Ω		

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED.

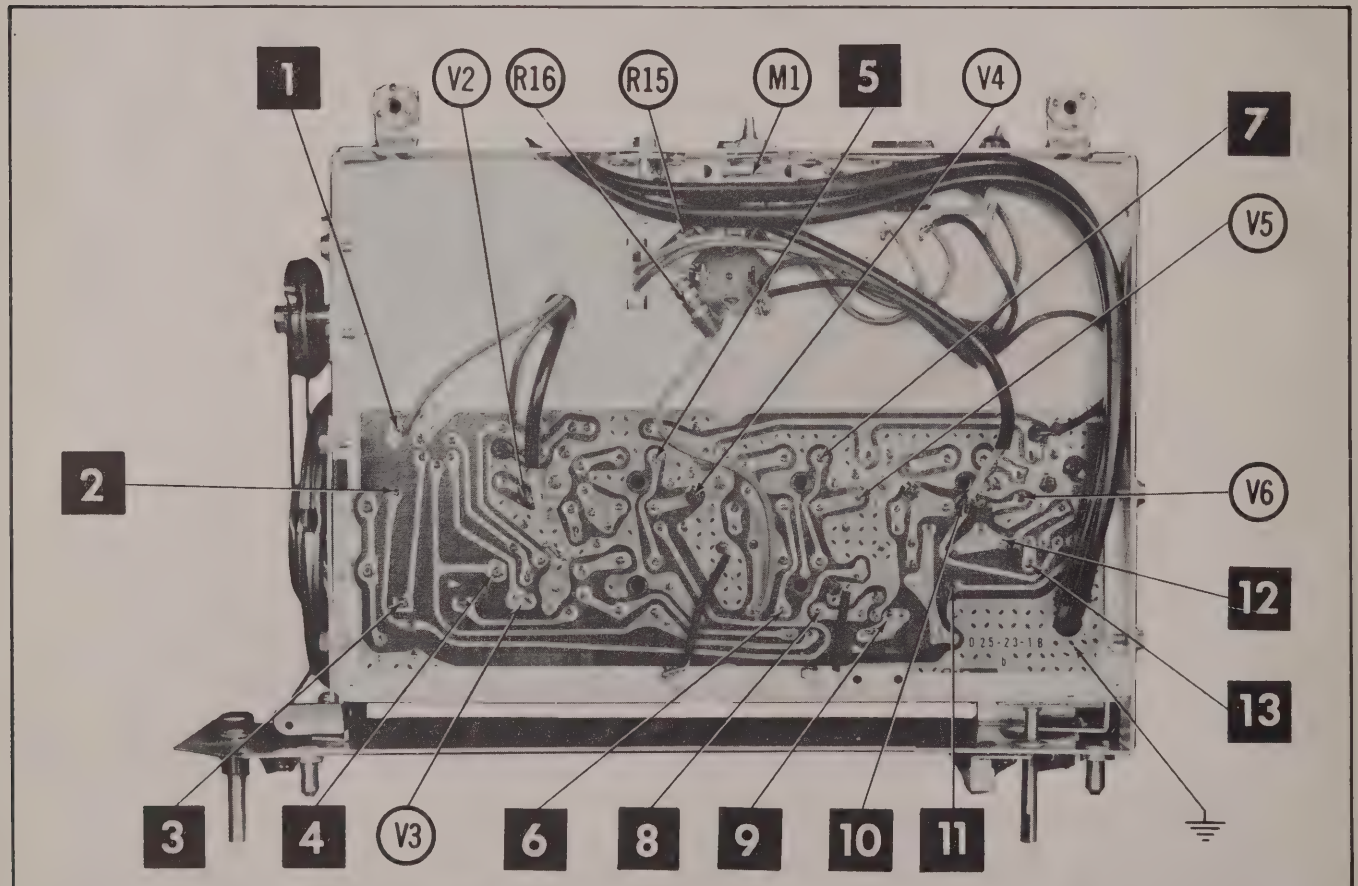
† MEASURED FROM OUTPUT OF M1.

†† MEASURED FROM OUTPUT OF M10.

▪ MEASURED IN "AM" POSITION.

■ MEASURED FROM PIN 3 OF V7.

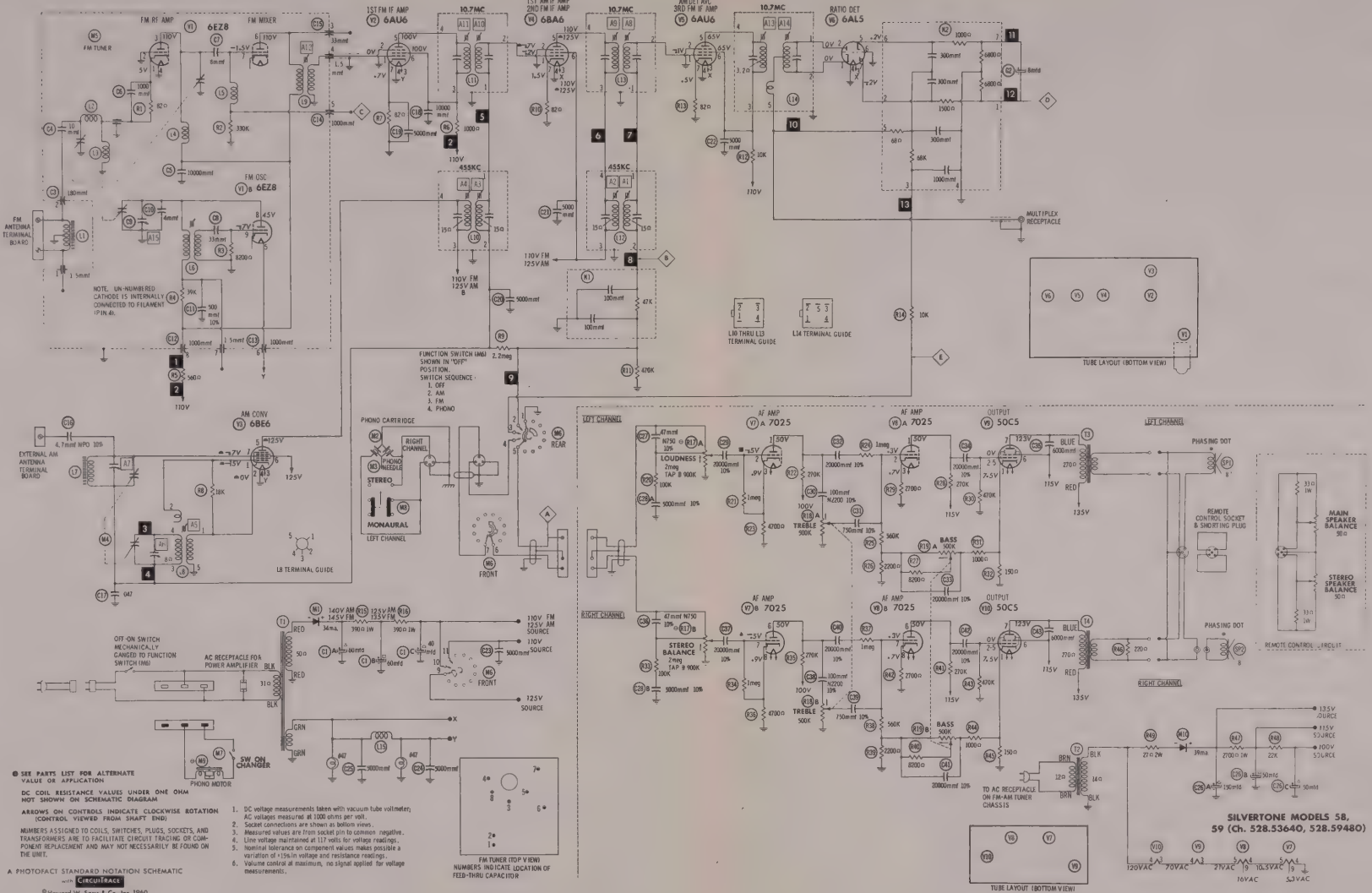
◆ MEASURED FROM PIN 7 OF V7.



A Howard W. Sams CIRCUITRACE* *TRADE MARK Photo

ARROWS INDICATING TUBE LOCATIONS ARE POINTING TO PIN 1 UNLESS OTHERWISE INDICATED

PRINTED BOARD



● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

NUMBERS ASSIGNED TO COILS, SWITCHES, PLUGS, SOCKETS, AND TRANSFORMERS ARE TO FACILITATE CIRCUIT TRACING OR COMPONENT REPLACEMENT AND MAY NOT NECESSARILY BE FOUND ON THE UNIT.

A PHOTOFACT STANDARD NOTATION SCHEMATIC with CIRCUITRACE

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1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±1% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

FM TUNER (TOP VIEW) NUMBERS INDICATE LOCATION OF FEED-THRU CAPACITOR

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.

Suggested Alignment Tools:
A1 thru A4, A8 thru A14 ..... GENERAL CEMENT #5097, 8727
WALSCO #2515
A5 ..... GENERAL CEMENT #8282, 8606, 8606L, 9295
WALSCO 2526, 2543, 2544, 2545
A6, A7, A15 ..... GENERAL CEMENT #5004, 5008, 5009
WALSCO #2520

AM ALIGNMENT

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	High side thru .1mfd to antenna stator lug of tuning gang. Low side to chassis.	455KC (400∿ Mod.)	AM	Tuning gang fully open	AC probe to point (A). Common to chassis.	A1, A2, A3, A4	Adjust for maximum deflection.
2.	Loop	532KC	"	Tuning gang fully closed	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.	"	1630KC	"	Tuning gang fully open	"	A6	Adjust for maximum deflection. Repeat steps 2 and 3.
4.	"	1400KC	"	Tune to 1400KC signal	"	A7	Adjust for maximum deflection while rocking tuning gang.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
5.	High side thru .01mfd to pin 1 (grid) of 1st FM IF Amplifier. Low side to chassis.	10.7MC (Unmod.)	FM	Point of non-interference	DC probe thru 47K to point (B). Common to chassis.	A8, A9, A10, A11	Adjust for maximum deflection.
6.	High side thru .01mfd to point (C). Low side to chassis.	"	"	"	"	A12	"
7.	"	"	"	"	DC probe thru 47K to point (D). Common to chassis.	A13	"
8.	"	"	"	"	DC probe to point (E). Common to chassis.	A14	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
5.	High side thru .01mfd to pin 1 (grid) of 1st FM IF Amplifier. Low side to chassis.	10.7MC (450KC Swp.)	FM	Point of non-interference	Vert. Amp. thru 47K to point (B). Low side to chassis.	A8, A9, A10, A11	Adjust for maximum gain and symmetry of response similar to Fig. 1.
6.	High side thru .01mfd to point (C). Low side to chassis.	"	"	"	"	A12	"
7.	"	"	"	"	Vert. Amp. thru 47K to point (D). Low side to chassis.	A13	Disconnect stabilizing capacitor C2. Adjust for maximum gain and symmetry of response similar to Fig. 1. Reconnect C2.
8.	"	"	"	"	Vert. Amp. to point (E). Low side to chassis.	A14	Adjust to place marker at the center of crossover lines similar to Fig. 2. SLIGHTLY retouch A13 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
9.	Across FM antenna terminals with 120Ω resistor in each lead.	108MC	FM	108MC	DC probe thru 47K to point (A). Common to chassis.	A15	Adjust for maximum deflection.

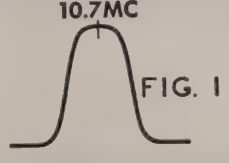


FIG. 1

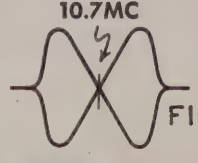
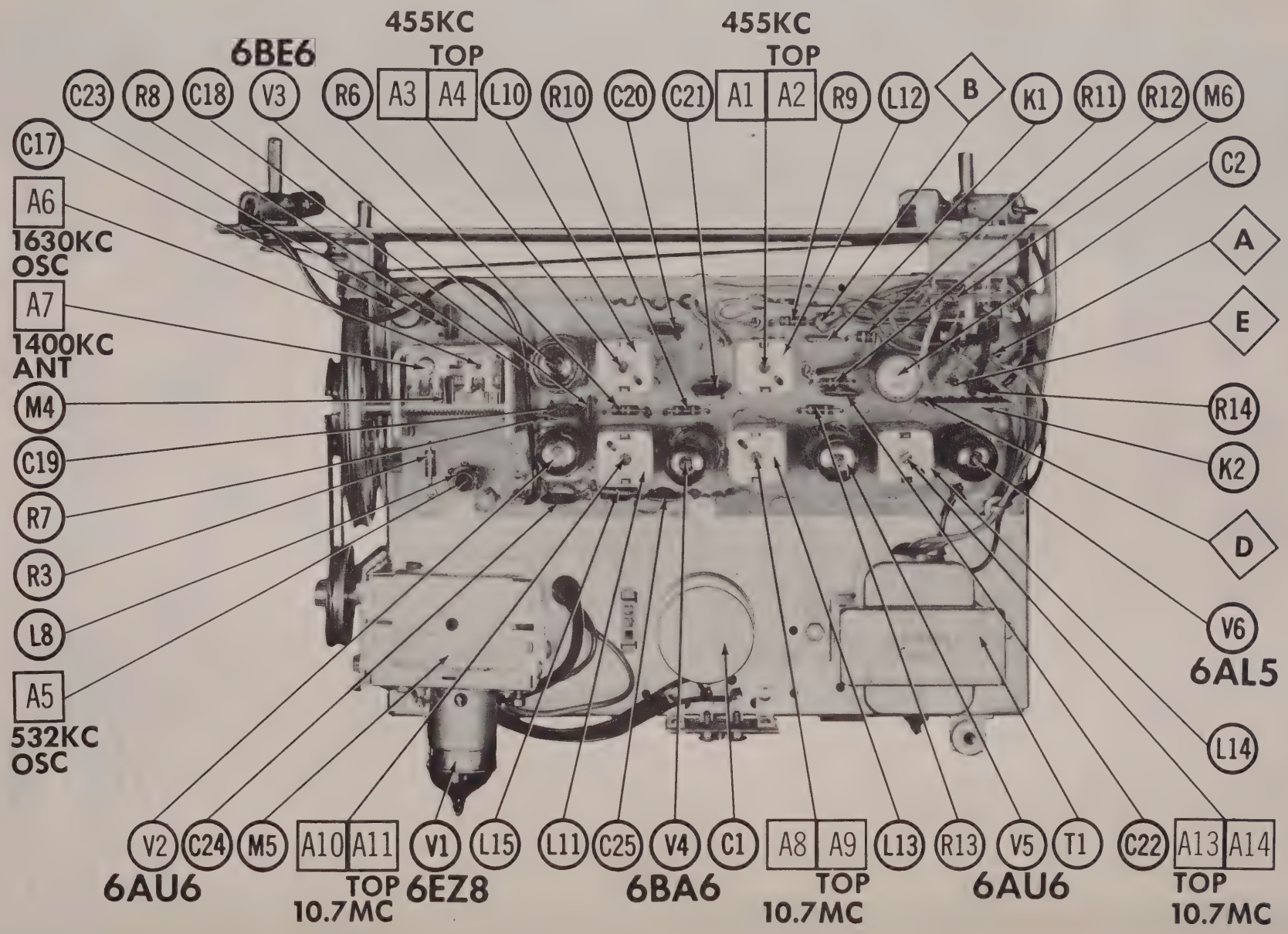


FIG. 2



TUNER-CHASSIS TOP VIEW

TUNER PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V1	FM RF Amplifier - FM Mixer - FM Osc.	6EZ8
V2	1st FM IF Amplifier	6AU6
V3	AM Converter	6BE6
V4	2nd FM IF Amplifier - 1st AM IF Amplifier	6BA6
V5	3rd FM IF Amplifier - AM Det. - AVC	6AU6
V6	Ratio Detector	6AL5

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	▲60	150	18-57-3	AFH3-21	XC0123	FP330. 9	TMQ-136	TVL-3443. 2	
B	■60	150							
C	▬40	150							
C2	8	50	18-98-5	PRS1405	BCD50008	TC41	TD-8-150	TVA-1405	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C3	180	#277-181						
C4	10		DI-10	DD-100	L10Q1	CCTO-100	CNO-410	10TCC-Q10
C5	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C6	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C7	8		NPO-DI 8. 2		C10V8C		GP580	10TCC-V82
C8	33		NPO-DI 33	DTZ-33	C10Q33C	CCTO-330	CNO-433	10TCC-Q33
C9								
C10	4	#220-409			C10V4C			10TCC-V39
C11	500 10%		1469-0005	DD-501	5R5T5	CM-20B-501K	MCB245	10TS-T50
C12	1000		EF-001	MFT-1000		CCF-102	CT280A	
C13	1000		EF-001	MFT-1000		CCF-102	CT280A	
C14	1000		EF-001	MFT-1000		CCF-102	CT280A	
C15	33	#275-330						
C16	4. 7 NPO 10%		NPO-SI 4. 7	TCZ-4R7	C10V47C	CCTO-4R7	CNO-547	10TCC-V47
C17	.047 200V		P2151N-047	DD-503	BC2S47J	4DP-3-473	ACE6147	2SE-S47
C18	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C19	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C20	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C21	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C22	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C23	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C24	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50
C25	5000		BPD-005	DD-502	BYA10D5	CCD-502	B-250	5HK-D50

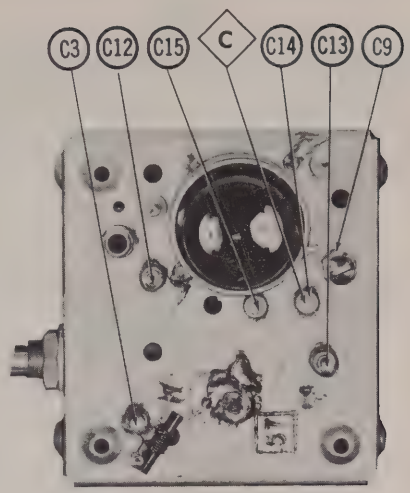
Silvertone Part Number.

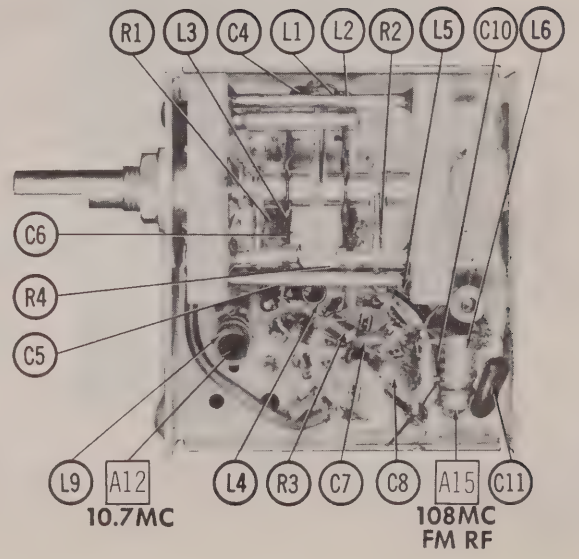
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R1	82Ω	
R2	330K	
R3	8200Ω	
R4	39K	
R5	560Ω	
R6	1000Ω	
R7	82Ω	
R8	18K	
R9	2. 2meg	
R10	82Ω	
R11	470K	
R12	10K	
R13	82Ω	
R14	10K	
R15	390Ω 1W	
R16	390Ω 1W	

FM RF SUB CHASSIS





TUNER PARTS LIST AND DESCRIPTIONS (Continued)

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	SILVERTONE PART No.	REPLACEMENT DATA
K1	AM Audio Filter	100mmf, 100mmf, 47K	13-2-2	Aerovox PA-97 Centralab PC-50 Cornell-Dubilier 11TM1 Sprague D-1
K2	Ratio Det. Network	(3) 300mmf, 1000mmf, 68Ω, 1000Ω, 1500Ω, (2) 6800Ω, 68K	13-35-3	Centralab PC-342

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA						NOTES
		SILVERTONE PART No.	Gramer PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	FM Antenna Coil	3191 †						
L2	RF Choke	3192-8 †						
L3	RF Choke	300-2 †						
L4	RF Choke	301-11 †						
L5	RF Choke	3190-24 †						
L6	FM Osc. Coil	3197 †						
L7	Loopstick	84-7542 ①						
L8	AM Osc. Coil	10-55-4						
L9	1st FM IF	3193 †						
L10	1st AM IF	10-116-2	16-6780	16-6780	BC-356	13-PC1	RF-4	
L11	2nd FM IF	10-117-2	16-3490	16-3490		1463-PC		
L12	2nd AM IF	10-116-2	16-6780	16-6780	BC-356	13-PC2	RF-4	
L13	3rd FM IF	10-118-2	16-3490	16-3490		1463-PC		
L14	Ratio Det.	10-29-0	17-3492	17-3492		1465-PC		
L15	Fil. Choke	10-28-0						

† Part of M5.

① Includes trimmer (Part #19-180-0).

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V ② .31A	150V ② .035A	6.3V ② 2A	80-36-0						

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	SILVERTONE PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M1	.034A	86-21-3 ①	RS065 ①	1234AH ①	65 ①	SR200 ②	① Selenium Type ② Silicon Type

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA							
	SILVERTONE PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M2	33-314-0	13TB	Not Req.	26	Not Req.			8TA4-S	N-8TA-S

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	SILVERTONE PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	
M3	83-1308 ♦†	W-103STSS † or W-103STDS ♦ †	S-69X † or S-69XSD † ♦ or S-69XDD ♦	† Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M4	Tuning Cap.	19-84-2	AM 2 Gang
M5	Tuner	95-201-0	FM Complete
M6	Switch	69-292-0	Function Selector
M7	Switch	84-7838	Off-On (Part of Changer)
M8	Switch		Stereo-Monaural (Part of Changer) (DPDT Slide Type)
M9	Motor	59-72	Complete, Changer Chassis 528.56640
	Motor	59-89	Complete, Changer Chassis 528.56641
	Printed Board	84-7535-0	Less Tubes

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

Low-Loss Shielded Lead (Interconnecting) ..... Use BELDEN No. 8401

Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

AMP PARTS LIST AND DESCRIPTIONS

TUBES

• CBS • GENERAL ELECTRIC • RAYTHEON • SYLVANIA •					
ITEM No.	USE	TYPE	ITEM No.	USE	TYPE
V7	Left Channel AF Amp. - Right Channel AF Amp.	7025	V9	Left Channel Output	50C5
V8	Left Channel AF Amp. - Right Channel AF Amp.	7025	V10	Right Channel Output	50C5

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C26A	▲150	150	18-40-3	AFH3-26	D0014	FP240	TMD-13	TVLS-3449.1*	
B	■50	150				TC495	TD-150-150		
C	▲50	150							

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C27	47 N750 10%		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C28A	5000 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
B	5000 10%		DI-5000		PM6D5	CCD-502	JL-250	10TS-D50
C29	20000 10%				PM6S2	6DP-2-203	GEM-1612	10TS-S20
C30	100 N2200 10%	#15-10111				*		30TCY-T10
C31	750 10%		DI-750	DD-751	1R5T75	CCD-751	GP375	10TS-T75
C32	20000 10%				PM6S2	6DP-2-203	GEM-1612	10TS-S20
C33	20000 10%				PM6S2	6DP-2-203	GEM-1612	10TS-S20
C34	20000 10%				PM6S2	6DP-2-203	GEM-1612	10TS-S20
C35	6000		DAC-22	DD16-602	HVE16D6	6DP-1-602	B-260	BL-D60
C36	47 N750 10%		N750-DI 47	DTN-47	C10Q47U	CCTN-470	CN7-447	10TCU-Q47
C37	20000 10%				PM6S2	6DP-2-203	GEM-1612	10TS-S20
C38	100 N2200 10%	#15-10111				*		30TCY-T10
C39	750 10%		DI-750	DD-751	1R5T75	CCD-751	GP375	10TS-T75
C40	20000 10%				PM6S2	6DP-2-203	GEM-1612	10TS-S20
C41	20000 10%				PM6S2	6DP-2-203	GEM-1612	10TS-S20
C42	20000 10%				PM6S2	6DP-2-203	GEM-1612	10TS-S20
C43	6000		DAC-22	DD16-602	HVE16D6	6DP-1-602	B-260	BL-D60

\# Silvertone Part Number.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SILVERTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R17A	2meg 900K Tap	½	24-332-0					Loudness, Left Channel ①
B	2meg 900K Tap	½						Stereo Balance, Left Chan. ①
R18A	500K	½	24-183-2	AB-60	AD47-500K-Z	Q13-133		Treble, Left Channel
B	500K	½		SR-60	Not Req.	M13-133		Treble, Right Channel
C	Shaft			AK-8	RS-3/16	NQ		
R19A	500K	½	24-183-2	AB-60	AD47-500K-Z	Q13-133		Bass, Right Channel
B	500K	½		SR-60	Not Req.	M13-133		Bass, Left Channel
C	Shaft			AK-8	RS-3/16	NQ		

① Some versions may use 2 meg-2meg dual Loudness (Part #24-364-0).

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R20	100K	
R21	1meg	
R22	270K	
R23	4700Ω	
R24	1meg	
R25	560K	
R26	2200Ω	
R27	8200Ω	
R28	270K	
R29	2700Ω	

ITEM No.	RATING	REMARKS
R30	470K	
R31	1000Ω	
R32	150Ω	
R33	100K	
R34	1meg	
R35	270K	
R36	4700Ω	
R37	1meg	
R38	560K	
R39	2200Ω	

ITEM No.	RATING	REMARKS
R40	8200Ω	
R41	270K	
R42	2700Ω	
R43	470K	
R44	1000Ω	
R45	150Ω	
R46	220Ω	
R47	2700Ω 1W	
R48	22K	
R49	27Ω 2W	#61-145-0

\# Silvertone Part Number

TRANSFORMER (POWER)

ITEM No.	RATING			REPLACEMENT DATA						
	PRI.	SEC. 1	SEC. 2	SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	117V @ .45A	117V @ .38A		80-4-7	23V80	P-3096			23V80	N-68X

AMP PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T3	2700Ω	6-8Ω	80-78-1	22S86	A-2902 ①	AU-604 ①	A-3849 ①	22S86		① Drill new mounting hole.
T4	2700Ω	6-8Ω	80-78-1	22S86	A-2902 ①	AU-604 ①	A-3849 ①	22S86		

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	SILVERTONE PART No.	QUAM PART No.	
SP1	8"	PM	6-8Ω	33-429-4	8A1Z7. 9	
SP2	8"	PM	6-8Ω	33-429-4	8A1Z7. 9	

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	SILVERTONE PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	
M10	.039A	86-20-3 ①	SD94 ①	HA154 ①	K200 ①	SR200 ①	① Silicon Type

CABINETS & CABINET PARTS

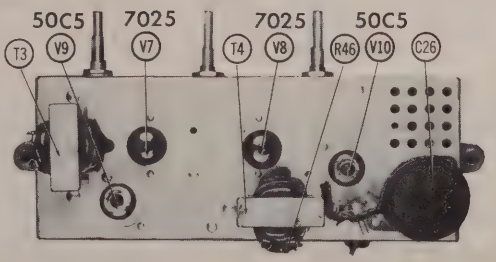
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	52-1264-0	Tuning, Function, Bass, Treble
Knob	52-1265-0	Loudness
Knob	52-1263-0	Stereo Balance
Knob	52-1237-0	Off-On, Reject (Part of Changer)
Knob	52-1238-0	Speed Control (Part of Changer)
Pointer	52-216-1	
Window	48-167-1	Dial Scale
Escutcheon	40-208-0	Control Panel
Cabinet	42-111-3	Model 58
Cabinet	42-112-3	Model 59
Cabinet	42-34-4	Stereo Enclosure, Model 58
Cabinet	42-35-4	Stereo Enclosure, Model 59
Leg	49-510	Model 58
Leg	49-511	Model 59

WIRING DATA

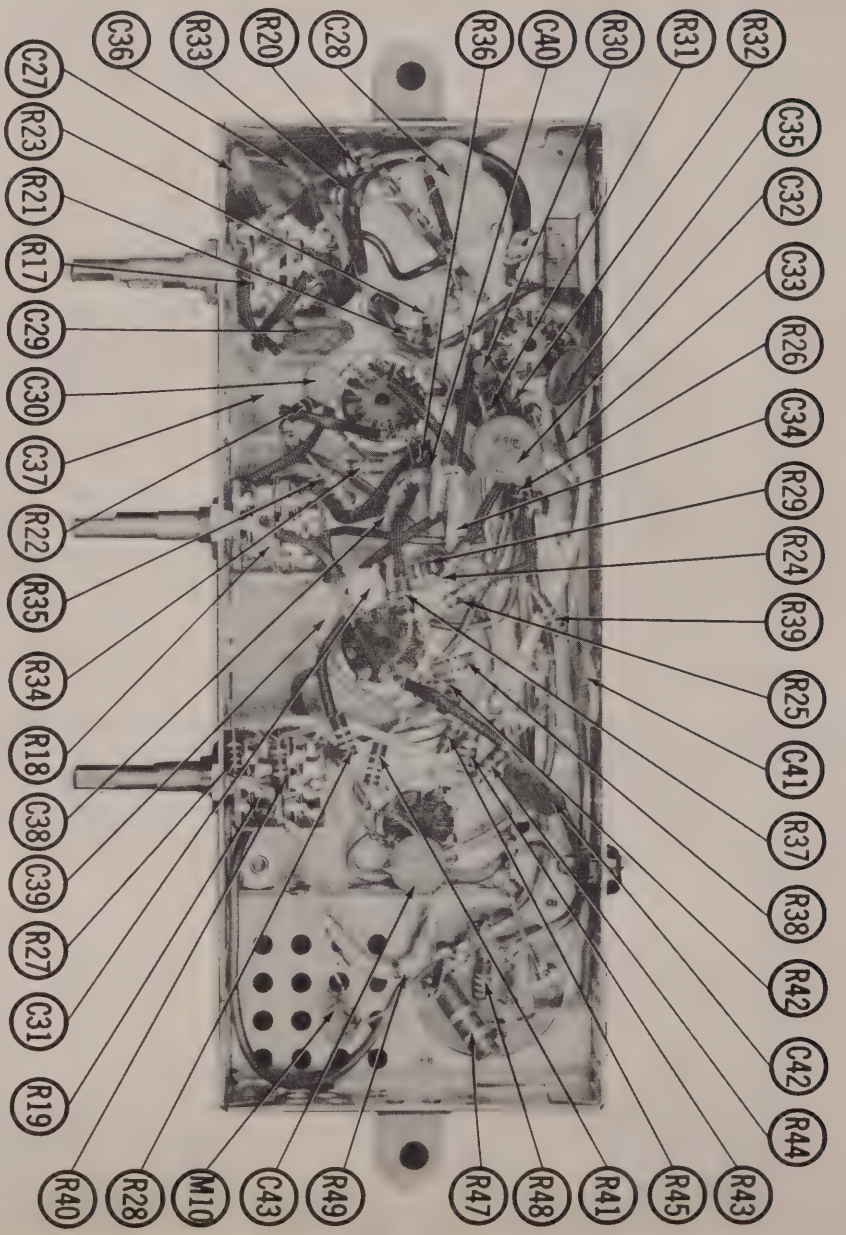
General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)



AMP CHASSIS—TOP VIEW

AMP CHASSIS—BOTTOM VIEW



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EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

TRAV-LER MODELS 1007, 1009, 1010, 1015, 1102

TRAV-LER MODELS 1007, 1009, 1010, 1015, 1102

MODEL 1102

TRAV-LER MODELS 1007, 1009, 1010, 1015, 1102

TRADE NAME	Trav-Ler Models 1007, 1009, 1010, 1015, 1102
MANUFACTURER	Trav-Ler Radio Corp., 571 W. Jackson Blvd., Chicago 6, Illinois
TYPE SET	AC Operated 3 Tube Stereo Phono Amplifier With 4 Speed Automatic Record Changer (Model 1007 is a Manual Record Player)
POWER SUPPLY	110-120 Volts AC, 60 Cycles RATING 33 Watts, .36 Amp. @ 117 Volts AC (Less Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER — SEE SIMILAR MONARCH UA8 — PHOTOFACT SET 381 FOLDER 11

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

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JF529

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V1	Channel 1 AF Amp. - Channel 2 AF Amp.	12AX7
V2	Channel 1 Output	50C5
V3	Channel 2 Output	50C5

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Trav-Ler PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	40	150	EC-71	PRS3625	BBRT43215	TCT3105	TDLT-3	TVA-3448	
B	30	150							
C	20	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C2	.05 600V		P688N-05	DD-503	CUB6S5	6DP-3-503	GEM-615	6TM-S5
C3	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C4	.05 600V		P688N-05	DD-503	CUB6S5	6DP-3-503	GEM-615	6TM-S5
C5	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C6	.05 600V		P688N-05	DD-503	CUB6S5	6DP-3-503	GEM-615	6TM-S5
C7	.05 600V		P688N-05	DD-503	CUB6S5	6DP-3-503	GEM-615	6TM-S5

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Trav-Ler PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	1meg	1/2	VC-118①	B-70	A47-1meg-Z	Q13-137	U53	Volume, Channel 1
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R2A	1meg	1/2	VC-118①	B-70	A47-1meg-Z	Q13-137	U53	Volume, Channel 2
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R3A	25K	1/2	VC-184②	B-26		Q11-120		Tone, Channel 1
B	25K	1/2		SR-26		M11-120	■ UE3959S	Tone, Channel 2
C	Switch			KR-1		76-1		

① Part #VC-186 used in Model 1007.
② Part #VC-185 used in Model 1007.
■ "STA-LOC" equivalent: FA253L, RU253L, CS3500, US41.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

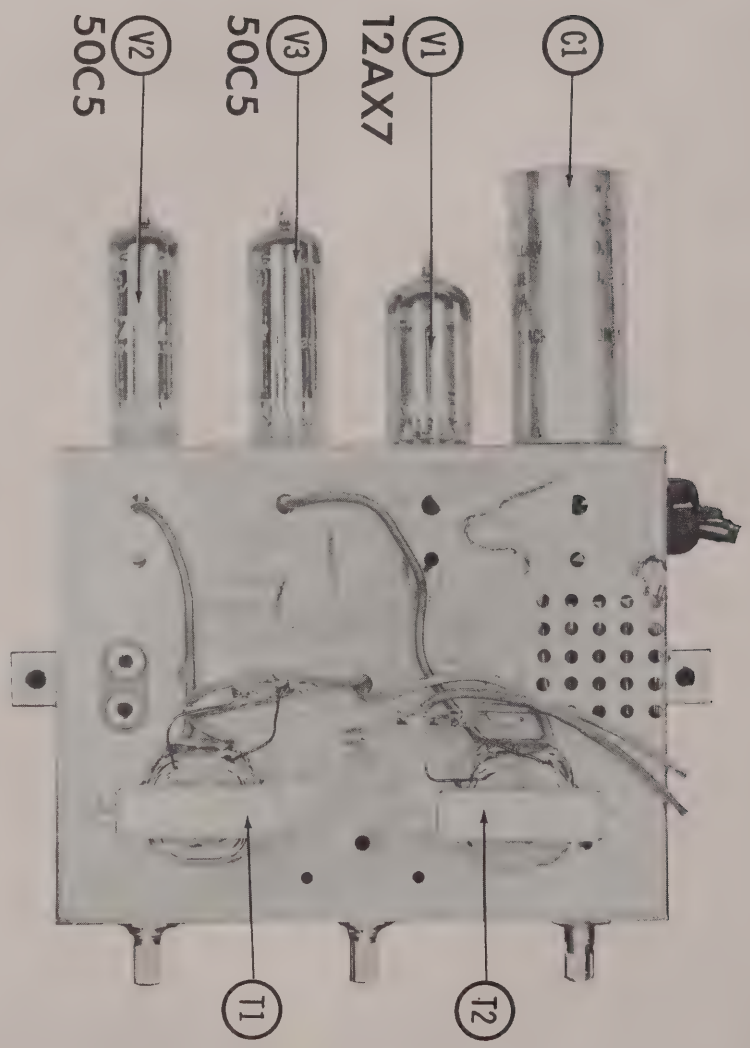
ITEM No.	RATING	REMARKS
R4	4700Ω	
R5	470K	
R6	4700Ω	
R7	470K	
R8	150Ω	

ITEM No.	RATING	REMARKS
R9	4700Ω	
R10	470K	
R11	4700Ω	
R12	470K	
R13	150Ω	

ITEM No.	RATING	REMARKS
R14	210Ω 5W	
R15	1000Ω 1W	
R16	22Ω 1W	
R17	47Ω 2W	Note 1

Note 1. Not used in some versions.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	Trav-Ler PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2400Ω	3-4Ω	AT-51	24S53	A-3025	AU-605	A-3332	24S53	S-12X	
T2	2400Ω	3-4Ω	AT-51	24S53	A-3025	AU-605	A-3332	24S53	S-12X	

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Trav-Ler PART No.	QUAM PART No.	
SP1	5"	PM	3-4Ω	SPK-36①	5A07	
SP2	5"	PM	3-4Ω	SPK-36①	5A07	① Models 1010, 1015, 1102
	4"	PM	3-4Ω	SPK-38②	4A1	② Models 1009, 1007

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					
	CURRENT (Measured)	Trav-Ler PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M1	.065A	SR-4①	T100①	1235AH①	100A①	SR200②	① Selenium Type ② Silicon Type

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA							
	Trav-Ler PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M2	PU-40	86-TS *	N8-7 N8-3	66 ‡	Not Req			8T-S *	Not Req.

* Includes Mounting.
‡ Use Mount PT-3.

PHONO NEEDLE

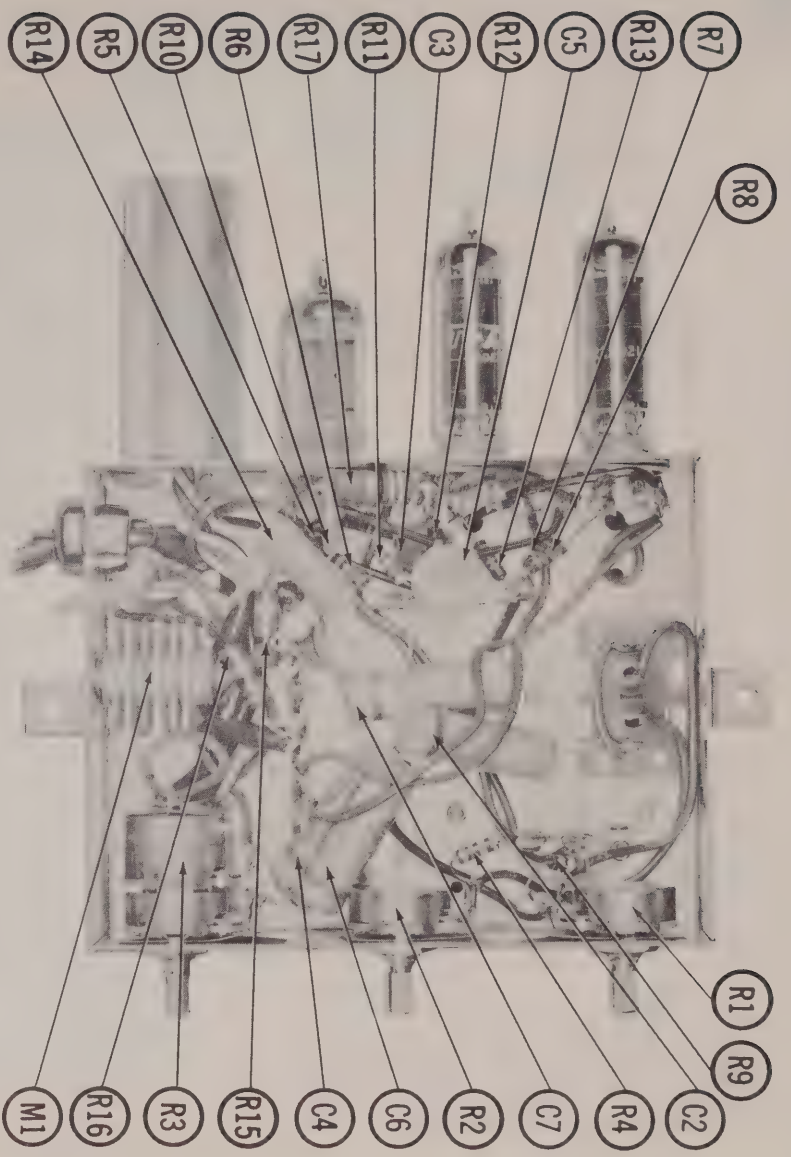
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

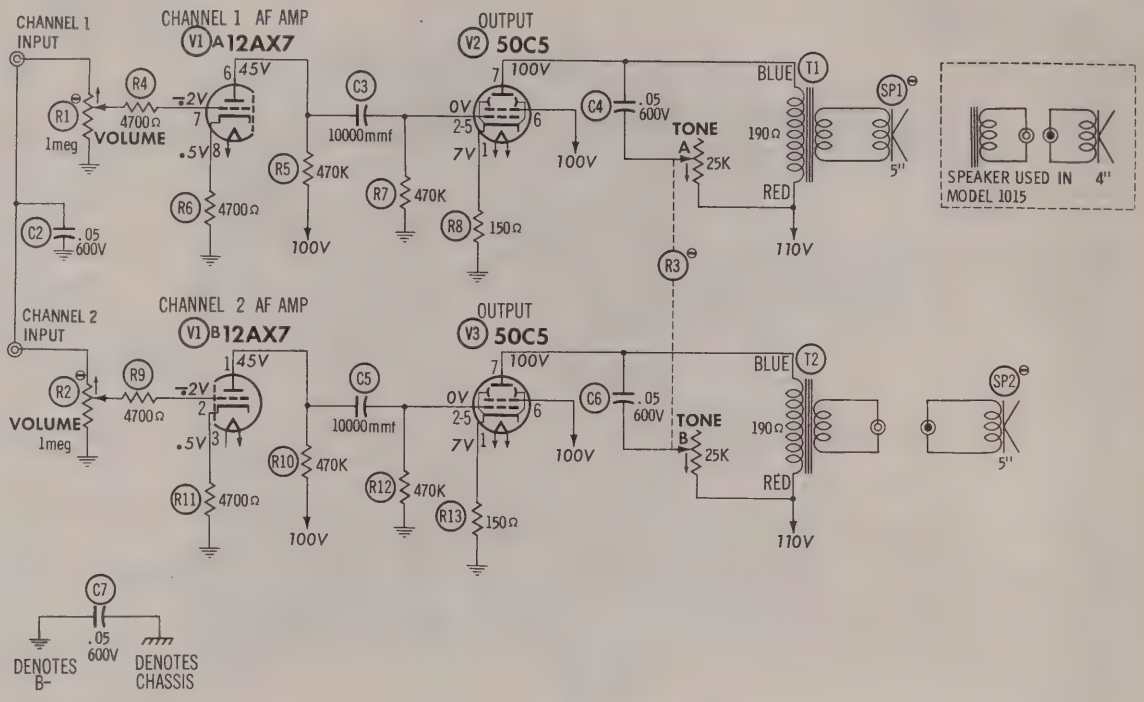
ITEM No.	REPLACEMENT DATA			REMARKS
	Trav-Ler PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	
M3		W-106STS † or W-106STD ♦	CRA-55 † or CRA-55X † or CRA-55XD ♦	† Jewel ♦ Diamond

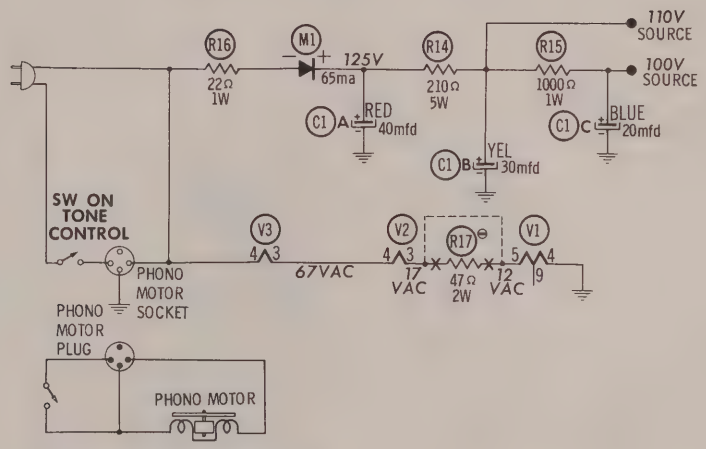
WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

CHASSIS—BOTTOM VIEW







RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†470K	4700Ω	4700Ω	0Ω	12Ω	†470K	4700Ω	4700Ω	6Ω
V2	50C5	150Ω	470K	59Ω	110Ω	470K	†1200Ω	†400Ω		
V3	50C5	150Ω	470K	110Ω	160Ω	470K	†1200Ω	†400Ω		

† MEASURED FROM OUTPUT OF M1.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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TRAV-LER MODELS 1007, 1009, 1010, 1015, 1102

PHOTOFACT® Folder

V-M MODELS
301, 312

MODEL 301

V-M MODELS
301, 312

TRADE NAME	V-M Models 301, 312		
MANUFACTURER	V-M Corp., Benton Harbor, Michigan		
TYPE SET	AC Operated 3 Tube Stereo Phono Amplifier With 4 Speed Automatic Record Changer		
POWER SUPPLY	110-120 Volts AC, 60 Cycles	RATING	34 Watts, .4 Amp. @ 117 Volts AC (Less Motor)

MODEL 301 USES AUTOMATIC 45RPM RECORD CHANGER
FOR SERVICE INFORMATION ON RECORD CHANGER USED IN MODEL 312 - SEE V-M 1201 - PHOTOFACT SET 436 FOLDER 18

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1960 Howard W. Sams & Co., Inc., Indianapolis 6, Indiana. Printed in U.S. of America

JT563

PARTS LIST AND DESCRIPTIONS

TUBES

◆ CBS ◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆

ITEM No.	USE	TYPE
V1	Channel 1 AF Amp. - Channel 2 AF Amp.	12AX7
V2	Channel 1 Output	50C5
V3	Channel 2 Output	50C5

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT.	V-M PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	
C1A	■80	200	12122		XB0241			TVLS-3486 *	
B	▲50	200			BR8035				
C	50	200							
C2	10	25	12046	PRS1250	BBR10-25	TC22	TD-10-25	TVA-1204	
C3	100	25NP	12124	NP-PRS7340	BR20015 †	TCN425		TVAS-1207.1*	

† Use 2 units. Connect negative terminals together.
Connect positive terminals into circuit the same as the original non-polarized unit.
* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

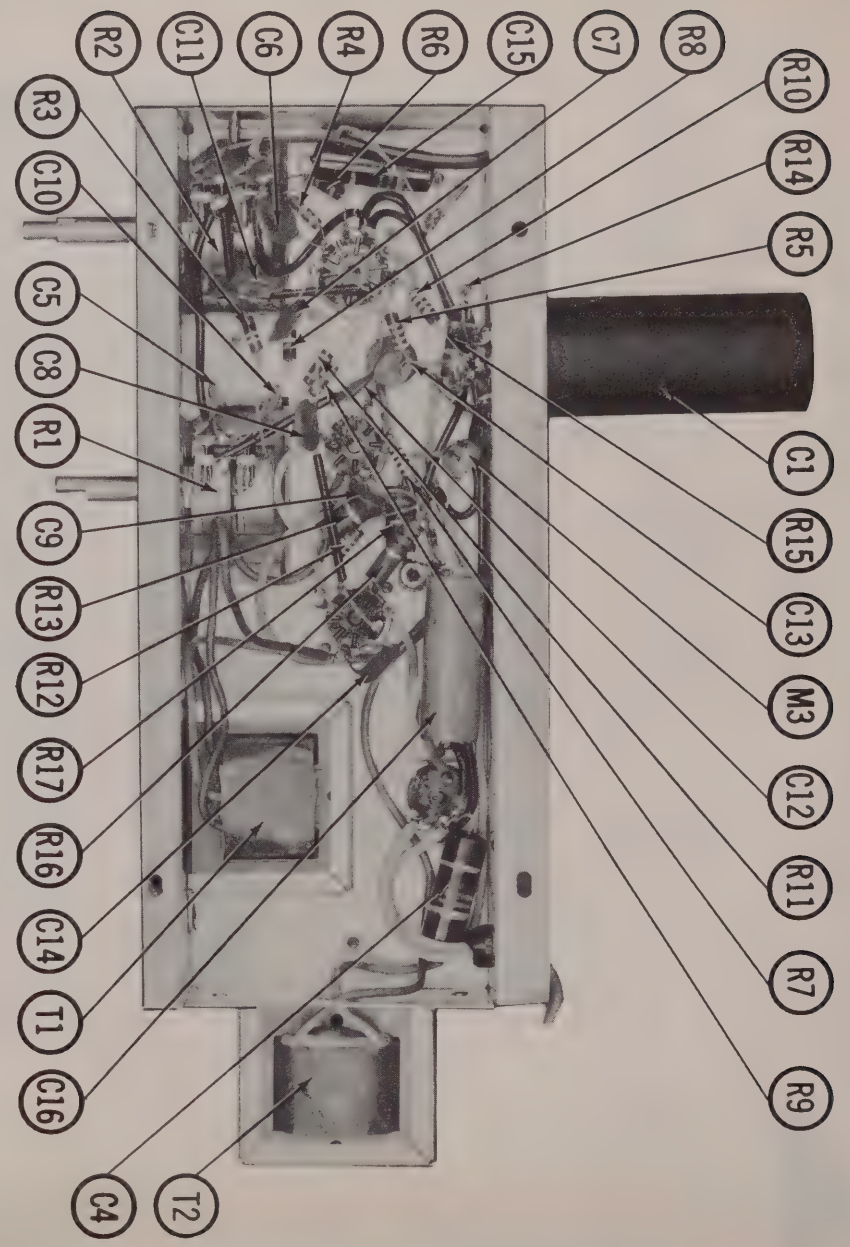
ITEM No.	RATING	REMARKS	REPLACEMENT DATA					
			AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C4	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C5	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C6	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C7	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C8	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C9	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C10	1000		BPD-001	DD-102	BYA10D1	CCD-102	B-210	5HK-D10
C11	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C12	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C13	10000		BPD-01	DD-103	BYA10S1	CCD-103	B-110	5HK-S10
C14	2000		BPD-002	DD-202	BYA10D2	CCD-202	B-220	5HK-D20
C15	.047 400V		P488N-047	DF-503	CUB4S47	4DP-3-473	GEM-4147	4TM-S47
C16	.047 400V		P688N-047	DF-503	CUB6S47	6DP-3-473	GEM-6147	6TM-S47

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	V-M PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	
R1A	2meg *	1/2	12390					Volume, Internal Speaker
B	2meg *	1/2						Volume, External Speaker
R2A	1meg	1/2	12391	B-70	AD47-1meg-Z	Q13-137		Tone, Internal Speaker
B	1meg	1/2		SR-70	Not Req.	M13-137	■ UE3913	Tone, External Speaker
C	Shaft	1/2		Not Req.	FS-3	Not Req.		

■ "STA-LOC" Equivalent: FA16A, RU16A, CS3500. * Tap ⓐ 200K.

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REMARKS
R3	100K	
R4	6.8meg	
R5	470K	
R6	470Ω	
R7	470K	

ITEM No.	RATING	REMARKS
R8	100K	
R9	6.8meg	
R10	470K	
R11	470Ω	
R12	470K	

ITEM No.	RATING	REMARKS
R13	100Ω 2W	
R14	2200Ω	
R15	68Ω 1W	
R16	10Ω 1W	
R17	33Ω 2W	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA							NOTES
	PRI.	SEC.	V-M PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	4100Ω CT	16Ω CT	12603							
T2	2100Ω	8Ω	12604							

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	V-M PART No.	QUAM PART No.	
SP1	5 1/4"	PM	3-4Ω	19322 ①	52A1 ①	① Phase Speaker, Model 312.
SP2	5 1/4"	PM	3-4Ω	19323 ①	52A1 ①	② Phase Speaker, Model 301.
SP3	5 1/4"	PM	3-4Ω	19322 ①	52A1 ①	
SP4	5 1/4"	PM	3-4Ω	19323 ①	52A1 ①	
	6"	PM	3-4Ω	19321 ②		
	6"	PM	3-4Ω	19822 ②		

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA								
	V-M PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		JENSEN PART No.		SONOTONE PART No.	
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE
M1	16708-C ① 19814-A ②	13T	Not Req.	13	Not Req.			8TA4-S	N-8TA-S

① Model 312. ② Model 301.

PHONO NEEDLE

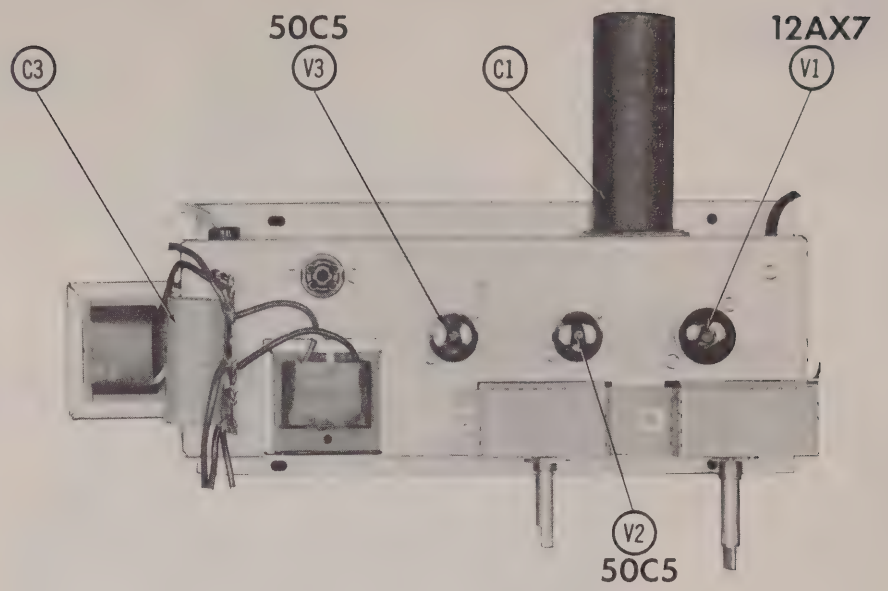
(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	V-M PART No.	CLEVITE WALCO PART No.	JENSEN PART No.	
M2	19737-A ①	W-103STSS †	S69X † or S69XSD † ♦ or S69XDD ♦	† Jewel ♦ Diamond ① Model 312

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					
	CURRENT (Measured)	V-M PART No.	INTERNATIONAL PART No.	ITT PART No.	SARKES TARZIAN PART No.	SYLVANIA PART No.	NOTES
M3	.076A	12602 ①	SD-500 ①	HA154 ①	K200 ①	SR200 ①	① Silicon Type

CHASSIS—TOP VIEW



MISCELLANEOUS

ITEM No.	PART NAME	V-M PART No.	NOTES
M4	Switch	8220	Monaural-Stereo, Model 312 (Part of Changer)
M5	Switch	467	Off-On, Model 312 (Part of Changer)
	Switch	14575	Off-On, Model 301 (Part of Changer)
M6	Motor	9134	Model 312
	Motor Assembly	18361	Complete, Model 312
	Motor Assembly	16936	Complete, Model 301

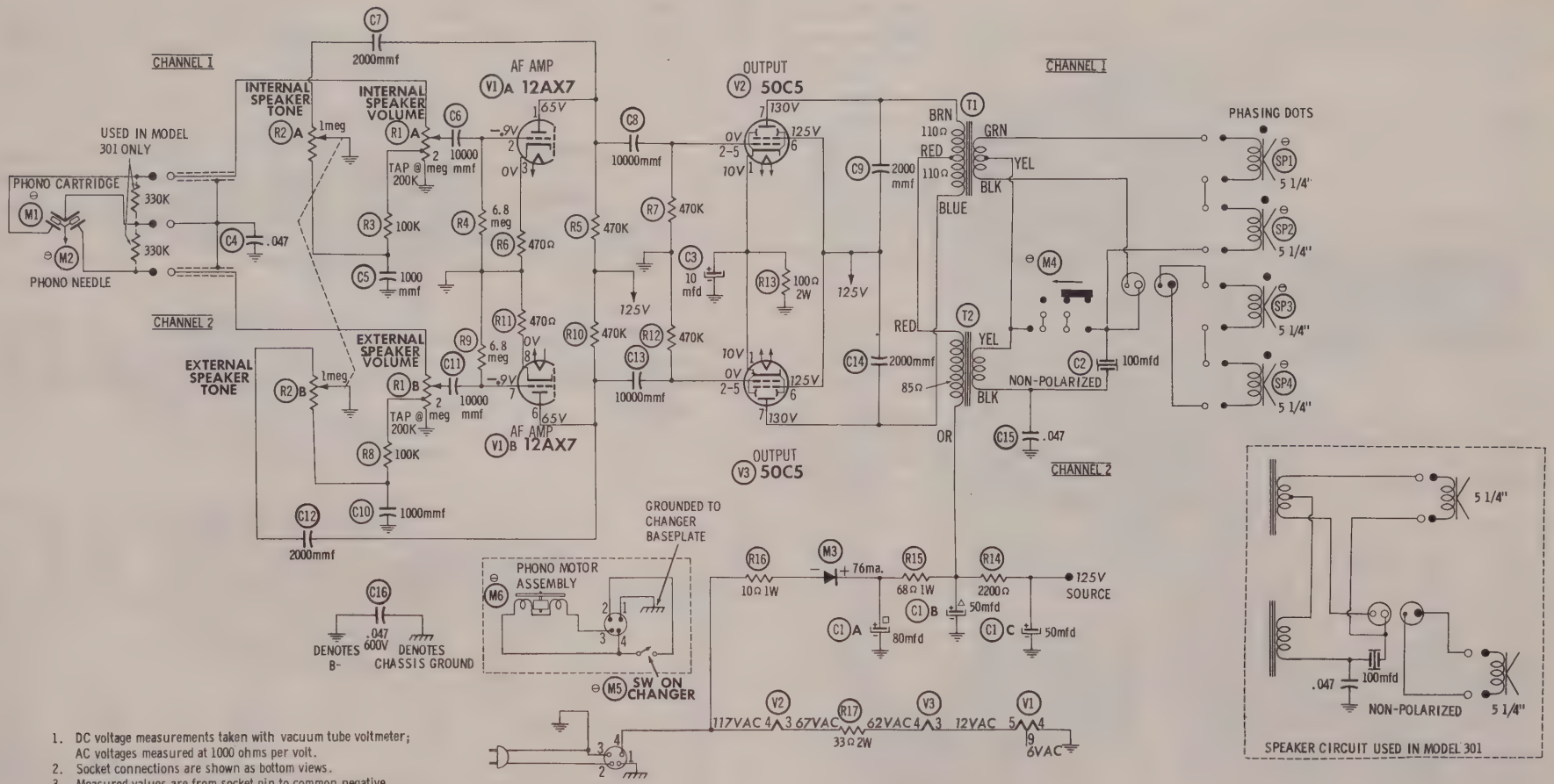
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	19725-A	Volume (Inner)
Knob	19726-A	Volume (Outer)
Knob	16828-C	Tone
Case	19650-A	Complete, Model 312
Case	19621-A	Complete, Model 301
Handle	19622	

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

Θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†470K	6.8meg	470Ω	0Ω	12Ω	†470K	6.8meg	470Ω	6Ω
V2	50C5	100Ω	470K	80Ω	130Ω	470K	†2200Ω	†250Ω		
V3	50C5	100Ω	470K	12Ω	62Ω	470K	†2200Ω	†280Ω		

† MEASURED FROM OUTPUT OF M1.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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V-M MODELS 301, 312

PHOTOFACT® Folder

ZENITH
MODEL S-14094

ZENITH
MODEL S-14094

GENERAL INFORMATION

The Zenith Model S-14094 is a two-speed record changer with a foldaway automatic 45-rpm spindle.

This changer will play 33 1/3-rpm records manually, or up to ten 45-rpm records automatically.

The Model S-14094 does not shut off after the last 45-rpm record has been played. Instead, it will repeat the last record until the tone arm is placed on its rest.

This record changer operates on 110-120 volts AC, 60 cycles only.

Manufactured by:

Zenith Radio Corporation
6001 Dickens Avenue
Chicago 39, Illinois

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SET 472 FOLDER 17

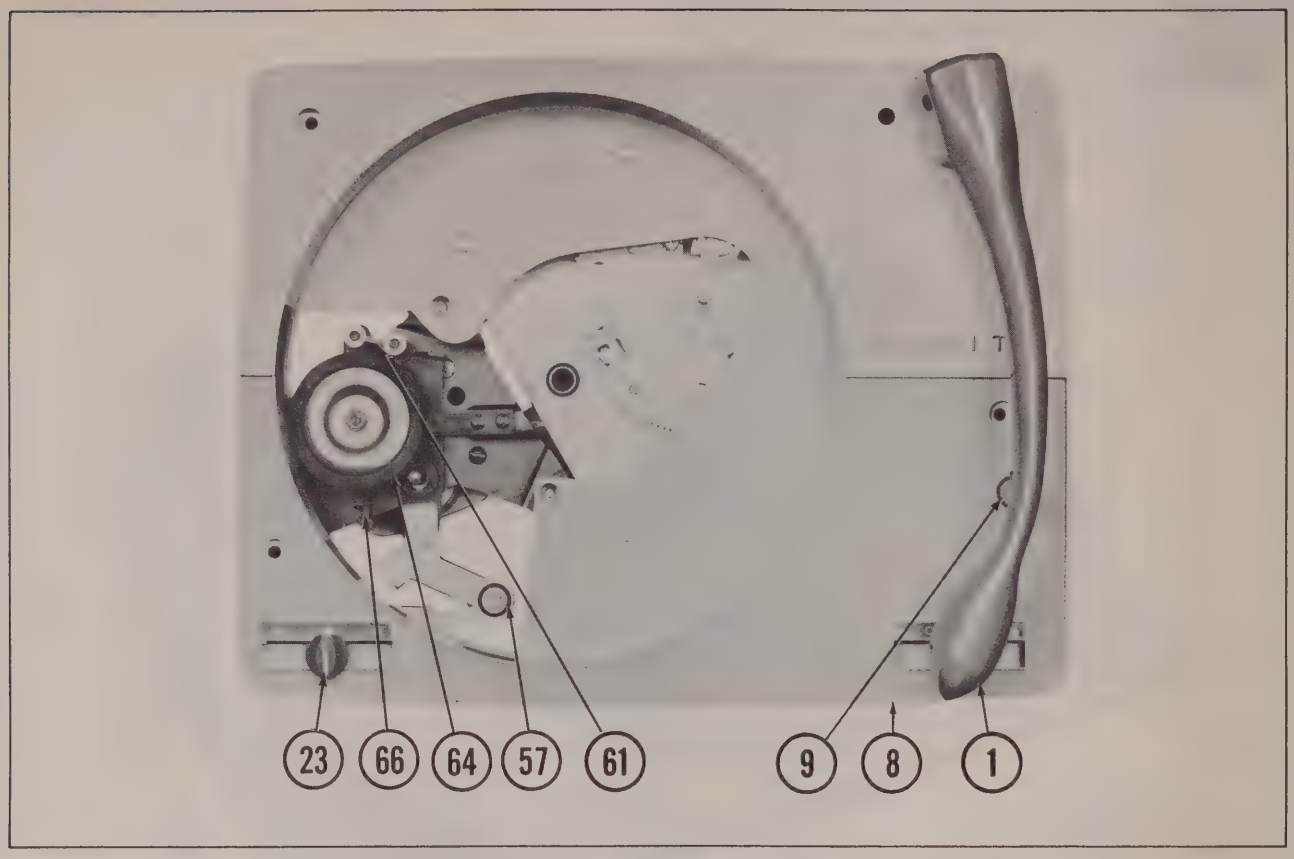


FIG. 1 TOP VIEW OF MECHANISM WITH TURNTABLE REMOVED

PREPARING FOR OPERATION

1. Lift tone arm to release the lock clip from the tone-arm rest post.
2. For 45-rpm operation, raise the two halves of the 45-rpm spindle so that they butt together.

FUNCTION OF CONTROLS

Speed Selector

Move the Speed Selector to the 45 or 33 position, depending upon the records to be played.

Record Change

This control operates for 45-rpm records only (33 1/3-rpm records must be played manually). Move this control to the right and release, to reject a record at any time.

OPERATING INSTRUCTIONS

To Play 33 1/3-Rpm Records

1. Place Speed Selector in 33 position.
2. Place a record on the turntable.
3. Place tone arm on lead-in groove of record.
4. At end of record, place tone arm on its rest post.

To Play 45-Rpm Records

1. Raise the two halves of the 45-rpm spindle so that they butt together.
2. Place up to ten 45-rpm records on the spindle.
3. Raise the tone arm to release the lock clip from the tone-arm rest post.
4. Push the Record Change knob to the right and release. The records will play automatically.
5. After the last record has been played, place the tone arm on its rest post.

NOTE: This changer does not automatically shut off after the last record has been played.

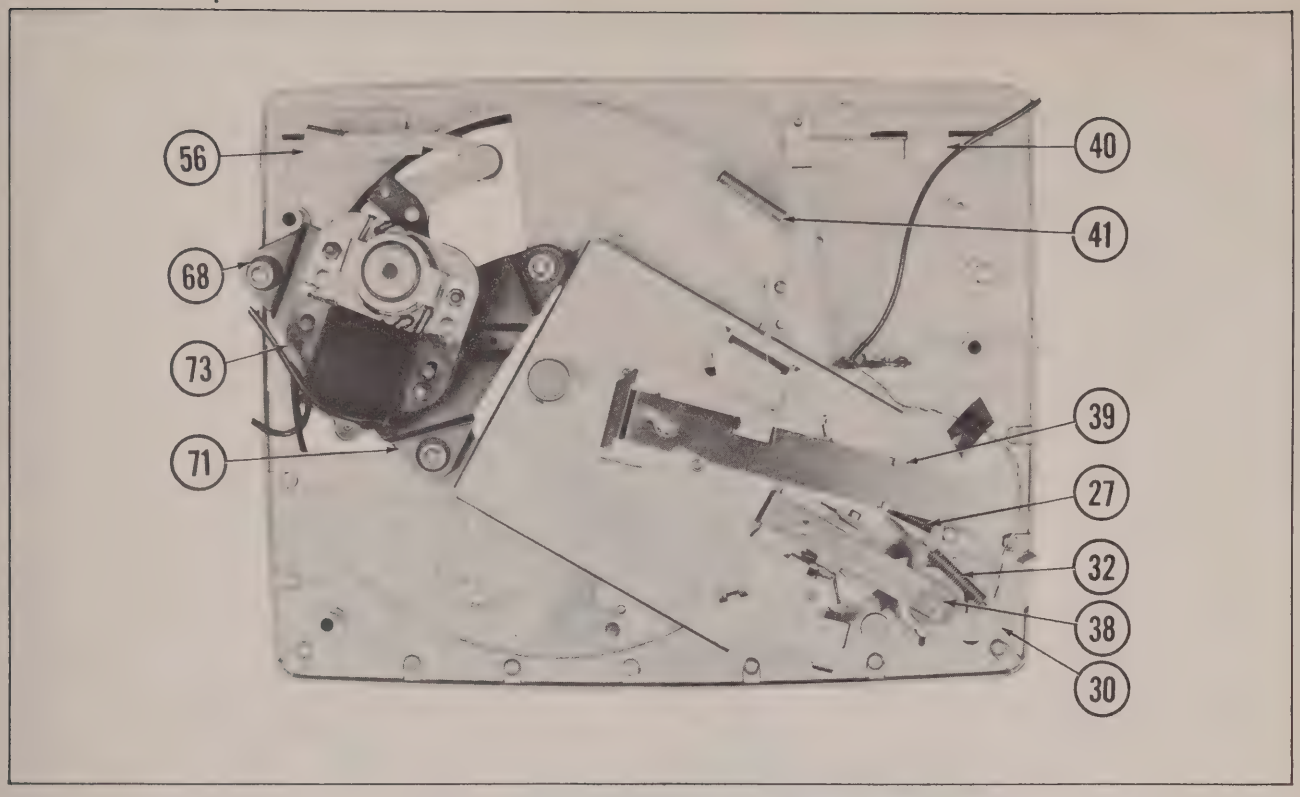


FIG. 2 BOTTOM VIEW OF MECHANISM

CHANGE CYCLE

The motions of the trip pawl and bushing assembly (48) are not sufficient to cycle the mechanism during one revolution of turntable (22). This assembly is actuated by the inward motion of the tone arm. The wiping action of the projection on the turntable hub prevents the trip pawl from engaging the hub during each revolution of turntable (22). Trip link (39) is moved when the Record Change button is pushed to the right or the tone arm enters the lead-in groove of the record. This action applies a force against the turned-up lance on friction pawl (48A). Trip pawl (48B) is moved toward the turntable hub because of the tension between it and friction pawl (48A). Trip pawl (48B) moves far enough to engage the projection on the turntable hub during one revolution. This action rotates clutch gear (53). As a result, the teeth on the hub of turntable (22) and clutch gear (53) engage, and start a change cycle.

Lift pin (33) is forced upward against height adjusting screw (3). Tone arm (1) rises as the cam follower on lift lever (38) rides up the cam surface on the side of clutch gear when this gear rotates.

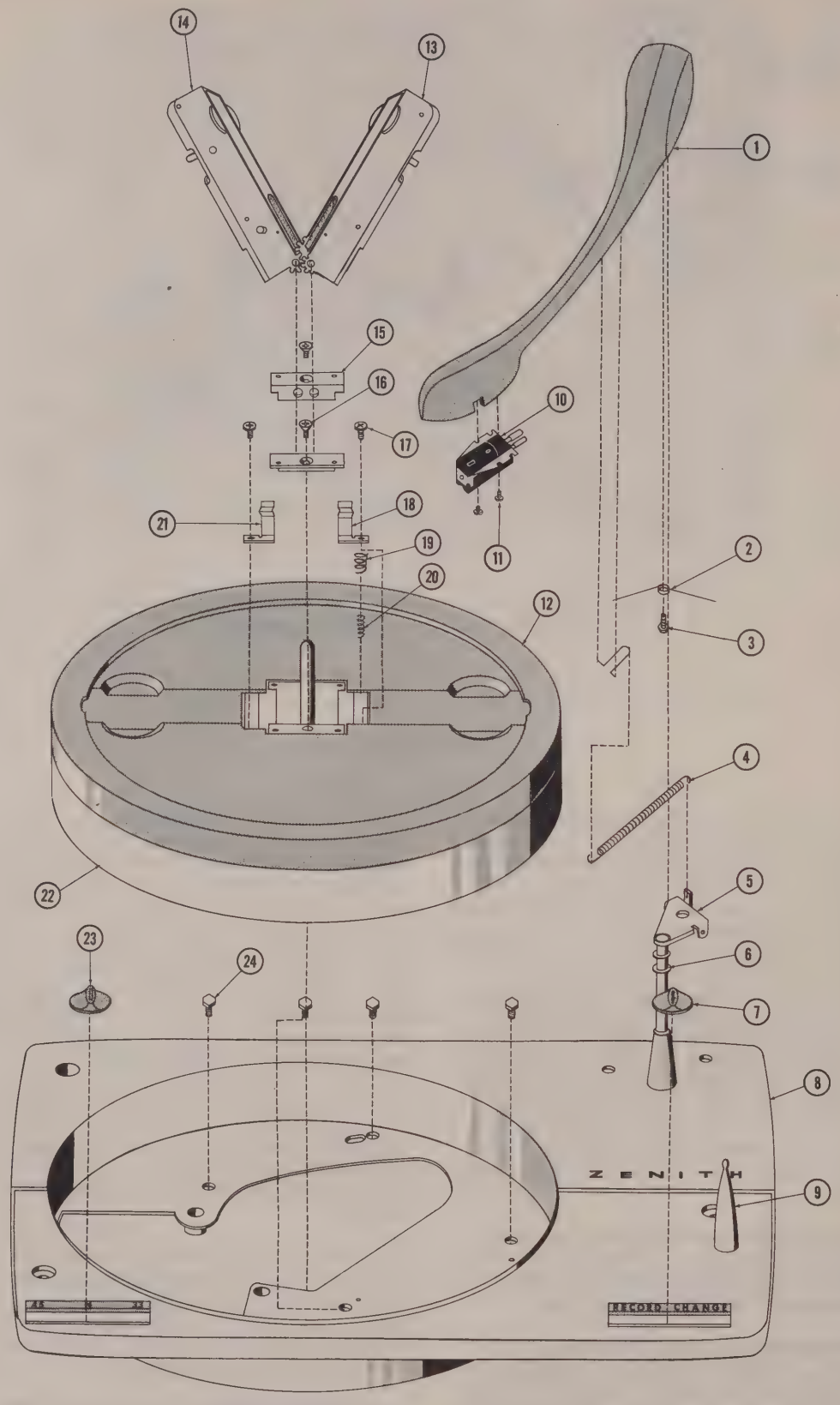
A stud mounted on clutch gear (53) releases brake detent lever (28). Pressure is applied to the brake drum on tone arm actuating lever and stud (25), so that tone arm (1) will not swing free as lift lever (38) starts up the cam surface.

The tone arm moves outward as soon as it is lifted. Throwout link (26), connected to a stud on tone arm actuating lever and stud (25), moves this lever. Trip pawl (48B) slides over a small piece of metal extending from the bottom of turntable mounting plate (37) while the tone arm is in its outward swing and resets trip pawl and friction pawl assembly (48) to prevent continuous tripping. Ejector roller (51) strikes the cam on right actuating lever (76) when clutch gear (53) rotates. As a result, the tone arm approaches the end of its outward travel and actuates one-half the 45-rpm automatic spindle. The other half of the spindle is actuated by pressure applied on left actuating lever (81) through adjustment screw (79), causing the next record to drop.

The tone arm starts its return travel to the setdown position when throwout link (26) passes the center line between the clutch gear hub and the stud on tone arm actuating lever and stud (25) after the last record is dropped and clutch gear (53) rotation is continued.

The change cycle is completed after clutch gear (53) completes one revolution, the cam follower of the lift lever re-enters the cam surface, and the tone arm drops to the record. At the same time, the stud on the clutch gear moves brake detent lever (28) away from the tone-arm brake drum.

To prevent the changer from cycling when the 45-rpm spindle is folded down into the turntable, the stud on right arm (13) pushes auto-manual pin and spring assembly (75) down so that it wipes the trip pawl back in order to clear the projection on the turntable hub.



A PHOTOFACT "EXPLODED" VIEW
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FIG. 3A EXPLODED VIEW OF PARTS ABOVE BASEPLATE

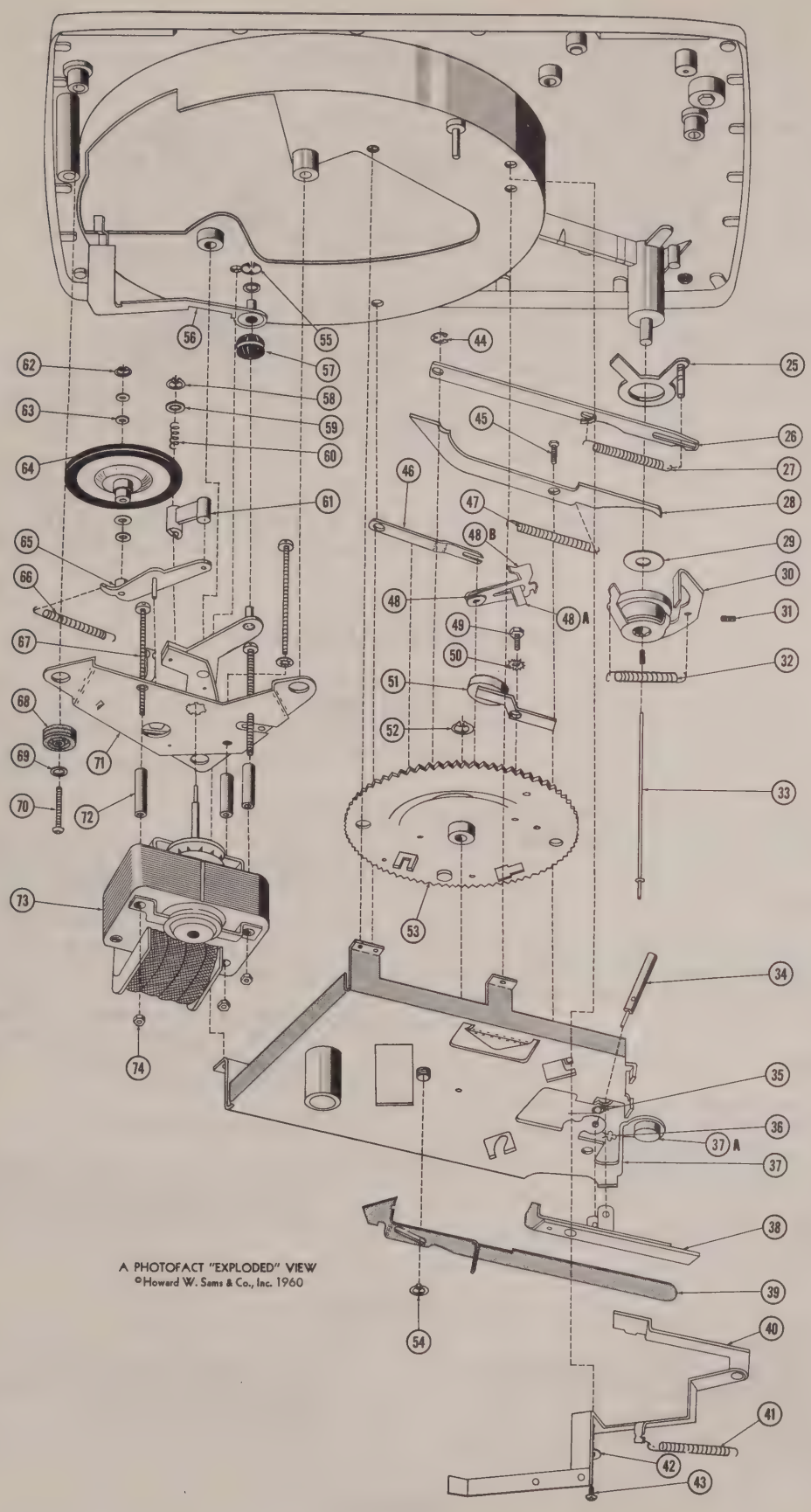

FIG. 3B EXPLODED VIEW OF PARTS BELOW BASEPLATE

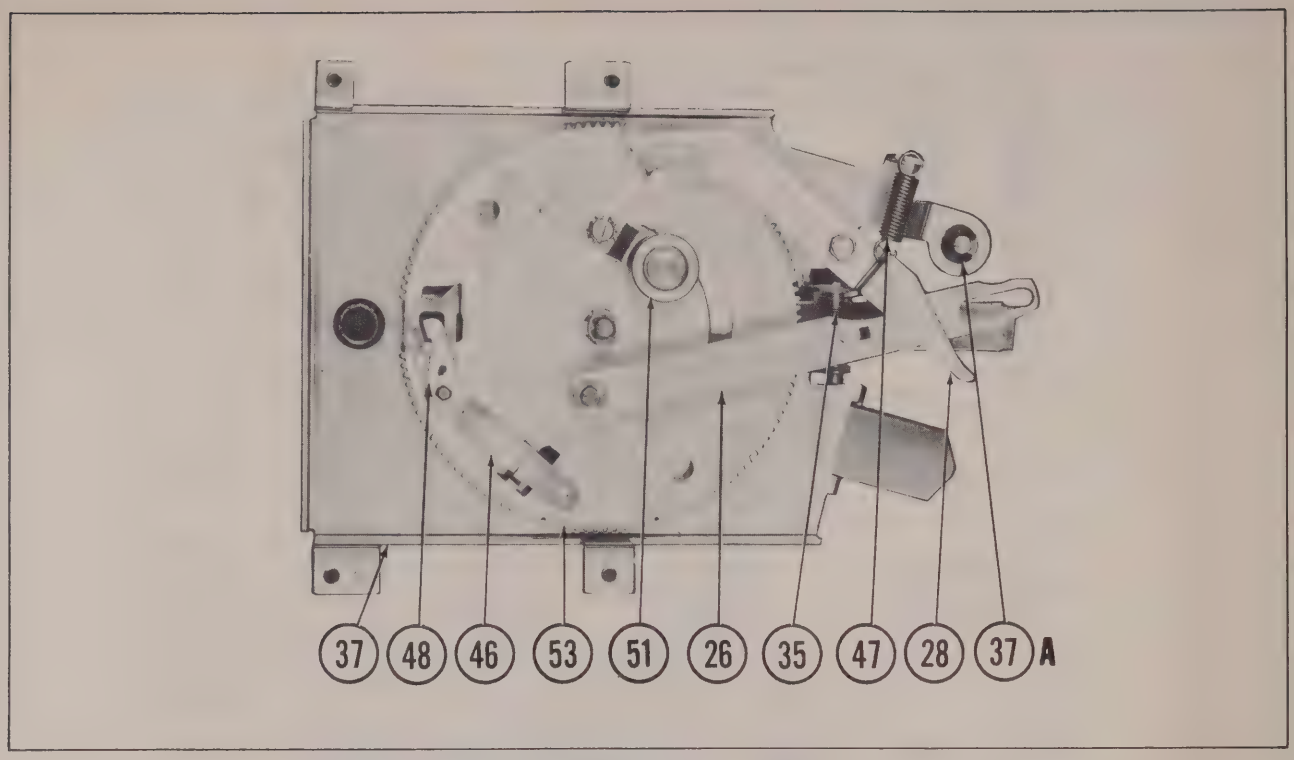

FIG. 4 CLUTCH GEAR ASSEMBLY

ADJUSTMENTS

Record Dropping

Adjust ejector roller (51) so that the record drops when the pickup arm is at its maximum outward travel.

Tone Arm Setdown

Turn tone arm adjusting cam (37A) until the tone arm sets down in the lead-in groove of the record. This cam is accessible through a hole in the baseplate, near the shaft.

Tone Arm Height

The tone arm height is properly adjusted when the tone arm lifts 1/8 inch with a 7/8-inch stack of records on the turntable. The height can be adjusted by turning height adjusting screw (3), on the underside of the tone arm, in either direction.

NOTE: The tone arm must not strike the bottom of any records stacked on the spindle.

Velocity Trip

1. Loosen the two set screws (31) on tone arm bushing and yoke assembly (30).
2. Place a 45-rpm record on the turntable, and set the tone arm approximately halfway in on the lead-in groove.
3. Adjust tone arm bushing and yoke assembly (30) so that it pushes trip link (39) far enough for trip pawl (48B) to engage the projection on the hub of the turntable.
4. Tighten set screws (31).
5. Bend the right-angle lance on tone arm bushing and yoke assembly (30) to correct any small error in adjustment.

LUBRICATION

1. Place one drop of good grade light machine oil on drive motor bearing and turntable spindle.
2. Use Sta-Put #320 or equivalent on all other bearing surfaces.
3. Use a medium-weight clinging-type grease on all sliding parts and on the cam surface on the side of the clutch gear.

CLEANING

Occasionally clean the drive motor spindle, idler wheel, and inside rim of the turntable with carbon tetrachloride or naptha in order to remove any oil, dirt, and grease.

TROUBLE CHART

SYMPTOM	CAUSE	REMEDY
Tone arm does not set down properly.	1. Tone arm out of adjustment.	1. See "Tone Arm Setdown" under "Adjustments."
	2. Changer not level.	2. Be sure changer is sitting on a flat surface.
Tone arm setdown varies.	1. Tone arm pivots loose.	1. Tighten pivots.
	2. Shaft and bracket assembly loose.	2. Tighten assembly.
	3. Brake action not sufficient because of weak brake spring (47) or lubricant on drum.	3. Replace brake spring (47) or remove lubricant from drum.
Tone arm skips grooves or slides over the record.	1. Changer not level.	1. Level changer.
	2. Stylus worn or broken.	2. Replace stylus.
Turntable rotates too fast or slowly.	1. Motor drive shaft not within tolerance.	1. Replace motor and link assembly (73).
Tone arm skips grooves.	1. Tone arm shaft and bracket (5) binding.	1. Check for other parts touching shaft, or lubricate bearing shaft (5).
	2. Pickup arm height improper.	2. See "Adjustments."
	3. Stylus broken or worn.	3. Replace stylus.
Changer starts slowly, and motor overheats.	1. Line voltage and frequency not of proper rating.	1. Be sure changer is connected to a 110-120 volt AC, 60-cycle line.
	2. Needs lubrication.	2. See "Lubrication."
Tone arm does not clear maximum load of records on turntable, or strikes records on spindle.	1. Tone arm out of adjustment.	1. See "Tone Arm Height" under "Adjustments."
Speed variation.	1. Turntable binding.	1. Lubricate turntable bearing.
	2. Turntable rim bent.	2. Replace turntable.
	3. Idler wheel (64) rough, oily, out of round, or not seated properly.	3. Replace idler wheel (64).
	4. Motor improperly suspended.	4. Motor must be equally suspended on all three grommets.
Turntable does not revolve.	1. No current to motor.	1. Check AC leads to motor.
	2. Defective motor (73).	2. Replace motor (73).
	3. Idler wheel (64) does not engage turntable rim.	3. Check for defective speed selector assembly or idler wheel; check for oil on the idler wheel, motor drive shaft, and turntable rim.

MECHANICAL PARTS LIST

Ref. No.	Part No.	Description
1	148-158	Tone Arm
2	80-1195	Height Adjusting Screw Spring
3	114-604	Height Adjusting Screw
4	80-1275	Tone Arm Tension Spring
5	S-43978	Tone Arm Shaft & Brkt. Ass'y.
6	93-1369	Tone Arm Thrust Washer
7	46-1894	Record Change Knob
8	57-2623	Baseplate
9	84-78	Tone Arm Rest
10	142-97	Pickup Cartridge
11	112-962	Cartridge Mounting Screws
12	29-48	Turntable Overlay
13	S-43987	Right Arm of 45-Rpm Spindle
14	S-43986	Left Arm of 45-Rpm Spindle
15	12-2521	Retaining Bracket (2)
16	71-125	4-40 x 1/32 Phils. Flat Hd. Mach. Screw (2)
17	112-1133	4-24 x 3/16 Phils. Pan Hd. Self Tapping Screw (2)
18	80-1206	Right Index Spring
19	80-1197	Auto-Manual Pin Spring
20	Part of Item 75	Spring
21	80-1205	Left Index Spring
22	S-43985	Turntable & 33 1/3-Rpm Spindle
23	46-2107	Speed Change Knob
24	114-180	6-20 x 1/4 x 1/4 Hex Hd. Self-Tapping Screw (4)
25	S-44110	Tone Arm Actuating Lever & Stud
26	118-63	Throwout Link
27	80-1201	Throwout Link Spring
28	117-221	Brake Detent Lever
29	93-1368	Tone Arm Shaft Washer
30	S-44101	Tone Arm Bushing, Yoke, & Set Screws
31	73-168	6-32 x 3/8 Slab Hd. Set Screw (2)
32	80-1198	Yoke Spring
33	S-45760	Lift Pin & Speed Nut Ass'y.
34	76-938	Lift Lever Pivot Pin
35	80-1286	Lift Lever Spring
36	80-1280	Retaining Spring
37	S-43989	Turntable Mtg. Plate, Bearing, & Stud Ass'y.
37A	128-72	Tone Arm Adj. Cam
38	S-43981	Lift Lever
39	118-62	Trip Link
40	S-44103	Record Change Lever Ass'y.
41	80-1199	Coil Spring
42		Flat Washer
43	112-1242	4-24 x 3/16 Phils. Rd. Hd. Self-Tapping Screw
44	188-149	Retaining Ring
45	112-1242	4-24 x 3/16 Phils. Rd. Hd. Self-Tapping Screw
46	80-1203	Trip Pawl Spring
47	80-1209	Brake Spring
48	S-46478	Trip Pawl, Friction Pawl, & Bushing Ass'y.
48A		Friction Pawl
48B		Trip Pawl
49	114-150	6/32 Mach. Screw
50		Lockwasher
51	S-43982	Ejector Roller
52	188-149	Retaining Ring
53	S-43984	Clutch Gear
54	188-149	Retaining Ring

Ref. No.	Part No.	Description
55	188-149	Retaining Ring
56	117-220	Motor Control Lever
57	125-94	Rubber Grommet
58		Retaining Ring
59	Part of	Flat Washer
60	Motor	Coil Spring
61	Ass'y.	Idler Pivot
62		Retaining Ring
63		Cambric Washer
64	61-214	Idler Wheel
65	Part of	Idler Wheel Mtg. Lever
66	Motor	Tension Spring
67	Ass'y.	Screws (3)
68		Rubber Grommet (3)
69	93-365	13/64 x 3/8 x 1/32 Steel Washer (3)
70	69-326	6-32 x 5/8 Phils. Rd. Hd. Mach. Screw (3)
71	Part of	Motor Mtg. Plate
72	Motor Ass'y.	Spacer (3)
73	S-45481	Motor & Link Ass'y.
74	Part of Motor Ass'y.	Hex Nut (3)
75	S-46828	Auto-Manual Pin & Spring Ass'y
76	117-213	Right Actuating Lever
77	114-668	4-40 x 1/4 x 3/16 Hex Hd. Mach. Screw (2)
78		Flat Washer
79	114-693	4/40 Hex Slot Hd. Mach. Screw
80	80-1260	Adjusting Screw Spring
81	117-215	Left Actuating Lever

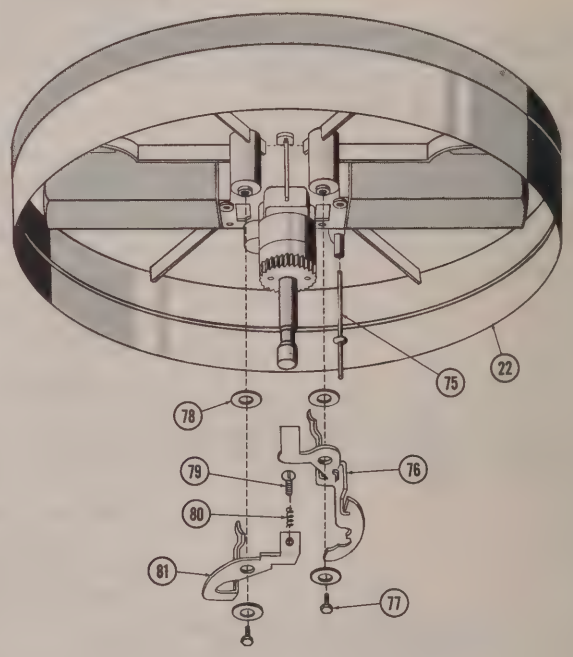

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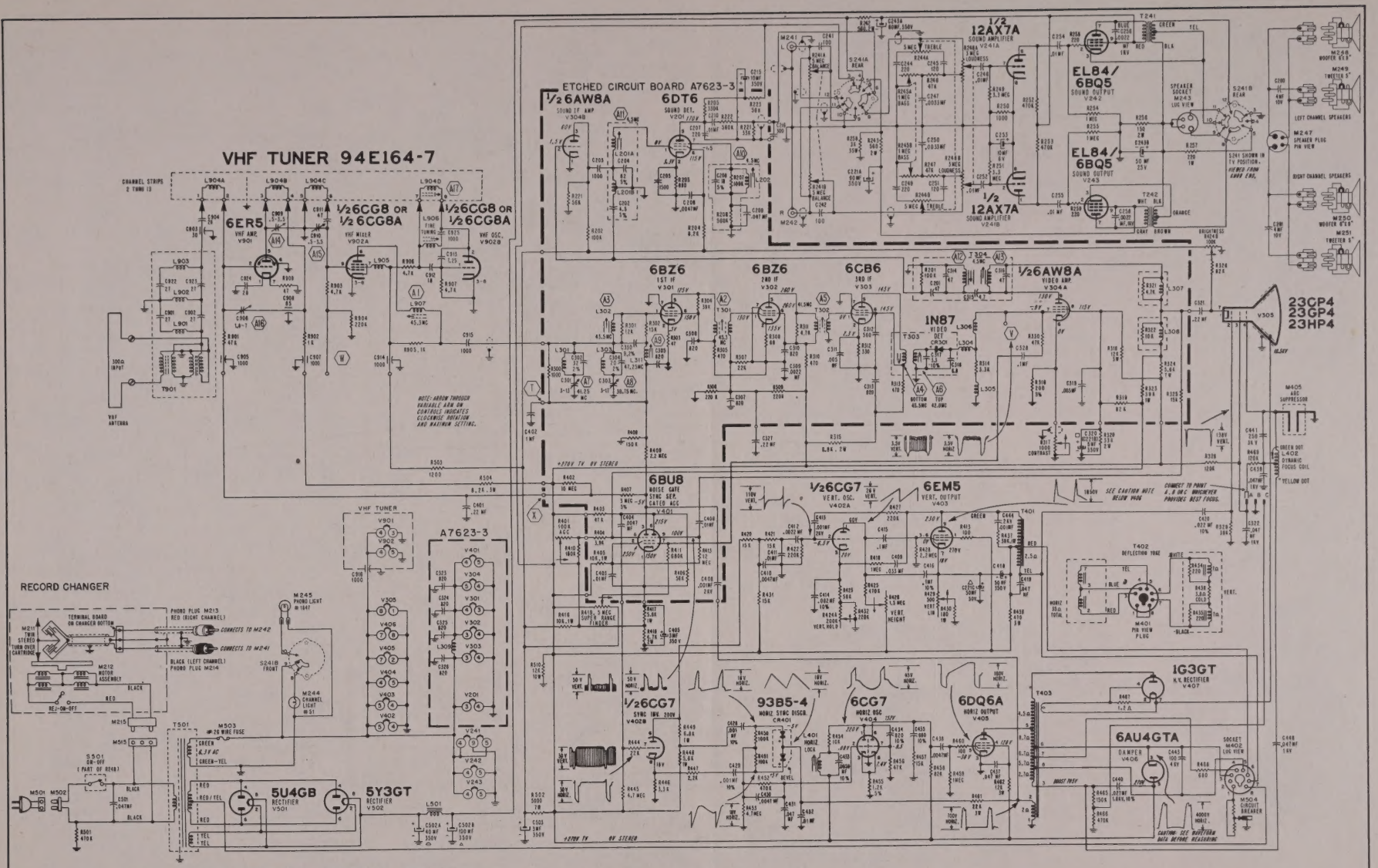
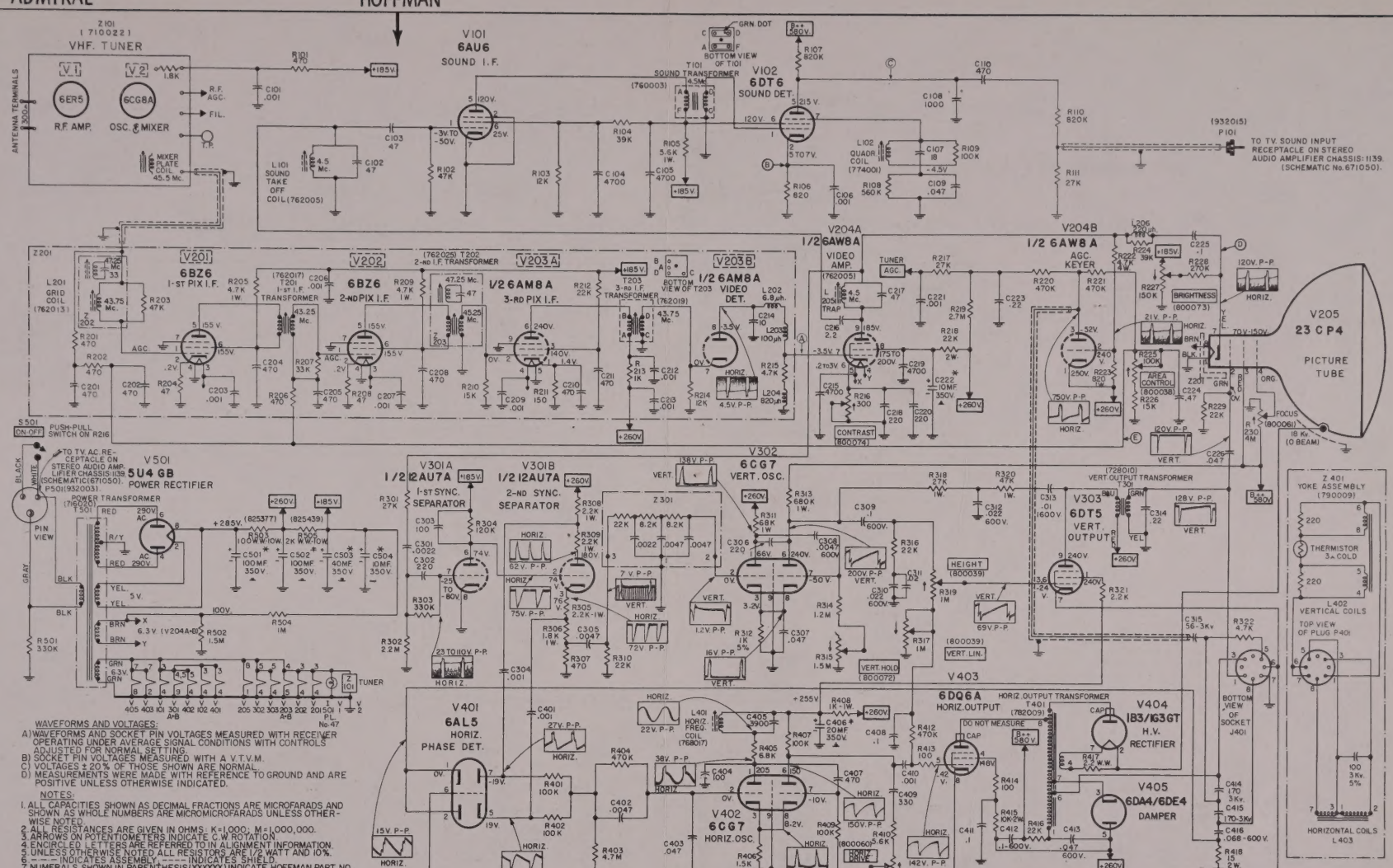
FIG. 5 EXPLODED VIEW OF TURNTABLE


VHF TUNER 94E164-7
ETCHED CIRCUIT BOARD A7623-3
6ER5
½6CG8 OR ½6CG8A
½6AW8A
6DT6
½ 12AX7A
EL84/ 6BQ5
6BZ6
6CB6
1N87
6BU8
½6CG7
6EM5
93B5-4
6CG7
6DQ6A
1G3GT
6AU4GTA
5U4GB
5Y3GT
23CP4
23GP4
23HP4
RECORD CHANGER
ADMIRAL MODELS ST24M61, ST24M62, ST24M63,
ST24M72, ST24M77 (CH. 20H6, 3S1)
Schematic Diagram Courtesy of Admiral Corporation

← ADMIRAL

HOFFMAN


Z101 (7100221) VHF. TUNER
V1 6ER5 R.F. AMP.
V2 6CG8A OSC. & MIXER
ANTENNA TERMINALS 300Ω
R.F. AGC.
FIL.
MIXER PLATE COIL 45.5 Mc.
L101 SOUND TAKE OFF COIL (762005)
V101 6AU6 SOUND I.F.
T101 SOUND TRANSFORMER (760003)
GRN. DOT
BOTTOM VIEW OF T101
V102 6DT6 SOUND DET.
L102 QUADR COIL (774001)
(932015) P101
TO TV SOUND INPUT RECEPTACLE ON STEREO AUDIO AMPLIFIER CHASSIS 1139. (SCHEMATIC No. 671050).
V201 6BZ6 1-ST PIX I.F.
V202 6BZ6 2-ND PIX I.F.
(762025) T202 2-ND I.F. TRANSFORMER
V203A 1/2 6AM8A 3-RD PIX I.F.
V203B 1/2 6AM8A VIDEO DET.
T203 3-RD I.F. TRANSFORMER
BOTTOM VIEW OF T203
L201 GRID COIL (762013)
T201 1-ST I.F. TRANSFORMER (762017)
V204A 1/2 6AW8A VIDEO AMP. (762005)
V204B 1/2 6AW8A AGC. KEYER
TUNER AGC
CONTRAST (800074)
BRIGHTNESS (800073)
AREA CONTROL (800038)
FOCUS (800061)
V205 23 CP4 PICTURE TUBE
S501 PUSH-PULL ON-OFF SWITCH ON R216
TO TV AC RECEPTACLE ON STEREO AUDIO AMPLIFIER CHASSIS 1139 (SCHEMATIC 671050).
P501 (932003)
V501 5U4 GB POWER RECTIFIER
POWER TRANSFORMER (760021)
PIN VIEW
V301A 1/2 12AU7A 1-ST SYNC. SEPARATOR
V301B 1/2 12AU7A 2-ND SYNC. SEPARATOR
V302 6CG7 VERT. OSC.
Z301
(728010) VERT. OUTPUT TRANSFORMER
V303 6DT5 VERT. OUTPUT
HEIGHT (800039)
VERT. LIN. (800039)
VERT. HOLD (800072)
Z401 YOKE ASSEMBLY (790009)
THERMISTOR 3Ω COLD
L402 VERTICAL COILS
TOP VIEW OF PLUG P401
HORIZONTAL COILS L403
V401 6AL5 HORIZ. PHASE DET.
V402 6CG7 HORIZ. OSC.
L401 HORIZ. FREQ. COIL (768017)
V403 6DQ6A HORIZ. OUTPUT
HORIZ. OUTPUT TRANSFORMER T401 (782009)
DO NOT MEASURE
V404 1B3/1G3GT H.V. RECTIFIER
V405 6DA4/6DE4 DAMPER
BOTTOM VIEW OF SOCKET J401
HORIZ. DRIVE

WAVEFORMS AND VOLTAGES:

A) WAVEFORMS AND SOCKET PIN VOLTAGES MEASURED WITH RECEIVER OPERATING UNDER AVERAGE SIGNAL CONDITIONS WITH CONTROLS ADJUSTED FOR NORMAL SETTING.
B) SOCKET PIN VOLTAGES MEASURED WITH A V.T.V.M.
C) VOLTAGES ± 20% OF THOSE SHOWN ARE NORMAL.
D) MEASUREMENTS WERE MADE WITH REFERENCE TO GROUND AND ARE POSITIVE UNLESS OTHERWISE INDICATED.

NOTES:

1. ALL CAPACITIES SHOWN AS DECIMAL FRACTIONS ARE MICROFARADS AND SHOWN AS WHOLE NUMBERS ARE MICROMICROFARADS UNLESS OTHERWISE NOTED.
2. ALL RESISTANCES ARE GIVEN IN OHMS. K=1,000; M=1,000,000.
3. ARROWS ON POTENTIOMETERS INDICATE C.W. ROTATION.
4. ENCIRCLED LETTERS ARE REFERRED TO IN ALIGNMENT INFORMATION.
5. UNLESS OTHERWISE NOTED ALL RESISTORS ARE 1/2 WATT AND 10%.
6. ——— INDICATES ASSEMBLY. - - - - INDICATES SHIELD.
7. NUMERALS SHOWN IN PARENTHESIS (XXXXXX) INDICATE HOFFMAN PART NO.
8. ELECTROLYTIC CAPACITORS MARKED * ARE IN CONTAINER PART NO. 857104, AND MARKED ÷ ARE IN CONTAINER PART NO. 856704.

HOFFMAN MODELS M3703, SP3703, W3703 (CH. 426)

Schematic Diagram Courtesy of Hoffman Electronics Corporation

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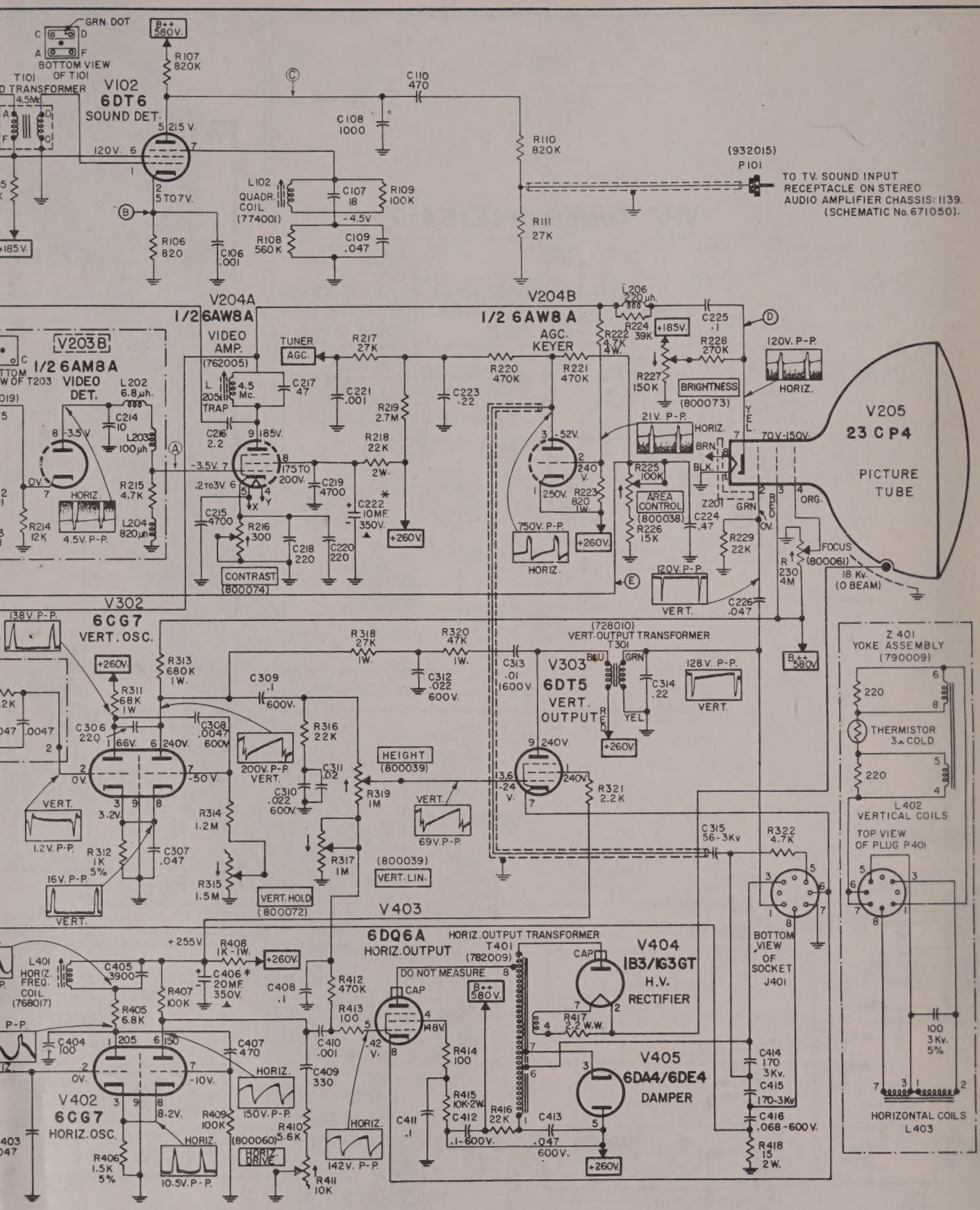
SET 472 FOLDER 18-S



Schematic Diagram Courtesy of Hoffman Electronics Corporation